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FLORA AUSTRALIENSIS.

FLORA AUSTRALIENSIS:

A DESCRIPTION
OF THE
PLANTS OF THE AUSTRALIAN TERRITORY.

BY
GEORGE BENTHAM, F.R.S.,
ASSISTED BY
BARON FERDINAND VON MUELLER, C.M.G., F.R.S.,
GOVERNMENT BOTANIST, MELBOURNE, VICTORIA.

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ROXBURGHIACEÆ TO FILICES.

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CONCLUDING PREFACE.

In bringing the present work to a close it had been my intention, as announced in the Preface to the first volume, to have supplemented it with an account of the species added to the Australian Flora during its progress, and a detailed examination of the relations as well of the whole flora to that of other countries, as of its component parts to each other. I now, however, find that this would entail more labour than at my age it would be prudent to undertake. The additional species have, moreover, been described by Baron von Mueller in his Fragmenta; and it is to be hoped that, in order to render these descriptions readily accessible to those who have to make use of my Flora, he will consolidate them into a methodical synopsis in conformity with the system I have adopted. This would give him the opportunity of re-arranging my genera with reformed characters in those cases where his views have proved to be at variance with mine.

With regard to Geographical Distribution, I can only repeat that recent discoveries and the additional data collected have generally confirmed the principles laid down by J. D. Hooker in the admirable Essay prefixed to his 'Flora Tasmaniæ,' and that it is only in minor details that corrections or additions have now to be made to it. These I am compelled to leave in other hands; but it may be useful on the present occasion to recapitulate shortly the general characteristics of the chief component parts of the present Flora of Australia (including Tasmania).

1. The predominant portion appears to be strictly indigenous. Notwithstanding an evident though very remote ordinal tribual or

generic connection with Africa, the great mass of purely Australian species and endemic genera, must have originated or been differentiated in Australia, and never have spread far out of it. The only exceptions observed are a few Australian types (*e.g.*, Eucalypti, Epacrideæ, Phyllodineous Acacias, etc.) appearing in the Malayan Archipelago, especially Timor, New Guinea and Borneo, where they have established distinct though generally nearly representative species, sometimes however preserving absolute identity, and a very few, chiefly annual or herbaceous plants of various Australian genera, found as far as South China, mostly in identical or very closely representative species.

2. The principal Flora showing an ancient connection between Australia and other countries is the Indo-Australian. A number of genera, whose main station is in tropical Asia, extend more or less into tropical and eastern sub-tropical Australia, sometimes in identical, sometimes in more or less differentiated species. Those of East Queensland have generally an East Asiatic character. A few Ceylonese and Peninsular types are more specially represented in Arnhem's Land. Scarcely any Indian forms are found to the westward of that Peninsula.

3. No less, if not more ancient, must be the connection of the mountain Flora of Victoria and Tasmania with the general southern extratropical and mountain region, extending through New Zealand to the southern end of the American Continent, and thence up the Andes. Many of the Australian species of this type are identical with or closely representative of New Zealand ones, and some have a much wider range. It is probably through this connection that a few species belonging to the temperate or cooler floras of the northern hemisphere have evidently, in very remote times, become represented in Australia.

4. Maritime plants, ranging at least from the Mascarene Islands to those of the Pacific, are also to be found on the Australian coasts, mostly in identical species, with the addition of a few representative ones.

5. An exchange has evidently taken place in plants not strictly maritime between North-east Australia and New Caledonia and other

islands of the South Pacific, but not to any great extent. More Australian types appear to be represented in New Caledonia than New Caledonian ones in Australia.

6. Introduction, as it were accidental, from various countries, very sparingly from natural causes from time immemorial, more rapidly through human agency direct or indirect since European colonisation has set in. Many European weeds and escapes from cultivation are becoming common in the Eastern colonies, a few plants commonly cultivated by Malays have established themselves in North-east Australia. South African weeds find a more genial home in the south-western districts. Very few American species have been imported excepting through Europe or South Africa.

7. A few plants, very different from any genuine Australian types, but identical or closely connected with species at home in far distant countries (North or Western America, East Mediterranean region, etc.) were met with by the first explorers of inland districts, under conditions which precluded any idea of recent introduction. These have been chiefly either annuals or herbaceous or even shrubby or arborescent species known to propagate readily by seeds, produced in abundance and apparently retaining for a long time their germinating power. The appearance of these plants in Australia is, however, in some instances not readily explained.

The principal features of the inland distribution of the indigenous flora, the remarkable isolation and highly differentiated character of that of the south-west corner, its continuity and the gradual connection and change of species, systematic as well as geographical, down the eastern side from Queensland down to Tasmania, and the wide spread of many desert species from Dampier's Archipelago to Spencer's Gulf and from the Murchison to the Maranoa, have long since been pointed out, and have since been confirmed by all recent observations.

A few other general characteristics of the flora may be adverted to, such as the absence of any Bambuseæ or Equisetaceæ, the paucity of Filices in the western moiety whether tropical or extratropical, and the very small number of endemic Filices in the whole region.

It is now my pleasing duty gratefully to acknowledge the handsome manner in which Baron von Mueller has fulfilled his promise of affording me every assistance in the prosecution of the arduous task I had undertaken. He has regularly transmitted to me, arranged for each volume, the vast stores of Australian specimens collected by his own exertions, as well as by the able collectors he has employed and the numerous residents and other correspondents whom he had inspired with a love for the science. I have been able also to take full advantage of the results of his own previous study of the specimens, as published in his Fragmenta, the sheets of which he has regularly forwarded to me as printed off. The specimens, after having been worked up, have been successively returned, and the numerous consignments have reached Melbourne without a single loss, the last of the Gramineæ and the ferns alone being still on their way home.

To the various other sources enumerated in the Preface to the first volume, as having supplied me with materials for this work, the most important additions I have to record are the valuable collections made by M. Schultz, at Port Darwin, and by some of the recent explorers of Central Australia, of which Dr. Schomburgk, the active Director of the Botanical Gardens of Adelaide, has transmitted to me almost complete sets, and a number of interesting specimens, chiefly from the northern districts of New South Wales and from Lord Howe's Island, sent to me by Dr. Moore, Director of the Sydney Botanic Garden.

December, 1877.

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CONSPECTUS OF THE ORDERS CONTAINED IN THE SEVENTH VOLUME.

CLASS II. **MONOCOTYLEDONS.**

(Continued from Vol. VI.)

** *Ovary superior.*

Series I. CORONARIÆ.—*Perianth more or less distinctly 2-seriate. Ovary syncarpous (except a few Palms). Seeds albuminous.*

† *Perianth-segments all petal-like or membranous and coloured.*

CXXVI. ROXBURGHIACEÆ. Perianth-segments 2 in each series. Stamens 4.

CXXVII. LILIACEÆ. Perianth-segments or lobes 3 in each series. Stamens 6 or fewer. Terrestrial herbs or climbers or arborescent.

CXXVIII. PONTEDERACEÆ. Aquatic herbs with slightly irregular flowers, otherwise as in Liliaceæ.

†† *Inner perianth-segments petal-like, outer ones calyx-like or wanting.*

CXXIX. PHILYDRACEÆ. Inner perianth of 2 broad petals, outer deficient. Stamen 1 perfect, 2 staminodia.

CXXX. XYRIDEÆ. Outer perianth of 1 deciduous hyaline or scarious segment; inner of 3 petal-like segments. Stamens 3 perfect, staminodia 3 or none.

CXXXI. COMMELYNACEÆ. Outer perianth of 3 thin or herbaceous segments, inner of 3 equal or unequal petal-like segments. Stamens 6 or fewer perfect, when fewer replaced by staminodia.

††† *Perianth-segments all calyx-like (rarely coloured and small).*

CXXXII. JUNCACEÆ. Stems rarely arborescent. No spatha.

CXXXIII. PALMÆ. Stems usually arborescent, or climbing and woody. Young inflorescence enclosed in a spatha.

Series II. NUDIFLORÆ.—*Perianth of small scales or none (except some* Alismaceæ*). Ovary apocarpous or monocarpillary (except a few* Aroideæ *and* Pandaneæ*).*

CXXXIV. PANDANEÆ. Flowers closely packed in dense spikes or heads with a bract at the base, diœcious. No perianth. Stamens in the males covering the rhachis Ovaries sessile often connate. Stem arborescent with leaves in a spire, or climbing and leafy.

CXXXV. AROIDEÆ. Flowers closely packed in a dense simple spike with a spatha at the base, unisexual or hermaphrodite. Fruit baccate. Seeds albuminous or in a few genera without albumen.

CXXXVI. TYPHACEÆ. Flowers closely packed in dense simple spikes or heads, the upper one or more male, the lower one or more female. Fruit-carpels small dry or drupaceous. Seeds albuminous. Tall semi-aquatic herbs.

CXXXVII. **Lemnaceæ.** Small floating green scale-like fronds without stems or leaves. Flowers and fruits minute on the edge or upper surface of the fronds. Seeds with or without albumen.

CXXXVIII. **Naiadeæ.** Aquatic or rarely marsh plants. Flowers solitary or loosely spicate. Fruit of small carpels or rarely capsular. No albumen.

CXXXIX. **Alismaceæ.** Aquatic or marsh plants. Flowers spicate or paniculate. Inner perianth of 3 or 2 petals, outer membranous or deficient. Ovary apocarpous. No albumen.

Series III. Glumales.—*Flowers sessile within imbricate bracts or glumes, in heads or spikelets. Perianth none or scarious or glume-like and usually concealed within the bracts. Ovary* 1-*ovulate or with* 1-*ovulate cells. Seeds albuminous.*

CXL. **Eriocauleæ.** Flowers unisexual in heads usually androgynous. Perianth-segments 6 or fewer, small and scarious or hyaline. Ovary 3- or 2-celled; ovules pendulous.

CXLI. **Centrolepideæ.** Flowers hermaphrodite or polygamous. No perianth. Stamen 1. Ovary of 1 or 2 or more cells; ovule pendulous. Small tufted plants.

CXLII. **Restiaceæ.** Flowers usually unisexual. Perianth of 6 rarely fewer glume-like segments usually exceedingly the bracts. Stamens 3. Ovary 1- 2- or 3-celled, ovule pendulous. Habit of Junceæ or Cyperaceæ. Leaf-sheaths with free margins.

CXLIII. **Cyperaceæ.** Flowers hermaphrodite or unisexual. Perianth none or of small scales or bristles concealed within the bracts, very rarely of 6 glume-like segments. Stamens various. Ovary 1-celled; ovule erect. Leaf-sheaths with the margins connate.

CXLIV. **Gramineæ.** Flowers hermaphrodite or unisexual. Perianth none. Stamens various. Style-branches usually feathery. Ovary 1-celled, ovule erect. Leaf-sheaths with free margins.

Class III. CRYPTOGAMÆ.

No real flowers. Fructification (in the Orders here included) consisting of spore-cases enclosing spores.

CXLV. **Lycopodiaceæ.** Spore-cases sessile in the axils of radical or cauline leaves or bracts.

CXLVI. **Marsileaceæ.** No true leaves. Fronds circinnate in vernation; barren ones linear or with a leaflike lamina, fertile ones forming an utricle or closed involucre including the spore-cases.

CXLVII. **Filices.** No true leaves. Fronds circinnate in vernation (except in *Ophioglosseæ*), the fertile ones bearing the spore-cases on their under surface or margins.

The remaining Order of Vascular Cryptogams, *Equisetaceæ*, is not represented in Australia, and Cellular Cryptogams are not included in the present work.

FLORA AUSTRALIENSIS.

ORDER CXXVI. ROXBURGHIACEÆ.

Flowers hermaphrodite, regular. Perianth inferior, of 4 deciduous segments, all nearly equal and similar, imbricate in 2 rows. Stamens 4, almost hypogynous; filaments very short, free or united in a ring; anthers erect, with 2 cells opening laterally or inwards in longitudinal slits. Ovary free, 1-celled; ovules several, either erect from the base or suspended from the apex of the cavity; stigma terminal, sessile. Fruit a capsule, opening in 2 valves. Seeds several, the funicle bearing as a strophiole a dense tuft of hairs or long linear papillæ; testa striate. Embryo linear or small, in a fleshy albumen.—Erect herbs or tall twiners. Leaves alternate opposite or verticillate, petiolate, with distant primary veins and transverse veinlets. Flowers 2 or more together on slender pedicels, in axillary clusters or short racemes.

Besides the typical genus, the order contains one other one from Japan.

1. ROXBURGHIA, Jones.

Perianth-segments several-nerved, lanceolate, acuminate. Filaments more or less united in a ring; anthers long-linear, the thickened connective produced into a long linear erect appendage. Ovules erect from the base of the ovary. Tall twiners, woody at the base. Flowers large or moderate-sized.

The genus comprises very few species, extending from Australia to Japan.

1. **R. javanica,** *Kunth, Enum.* v. 288, var. ? *Australiana.*—A glabrous twiner. Leaves alternate, from ovate to lanceolate, acutely acuminate, rounded truncate or shortly tapering at the base, mostly 3 to 4 in. long, on very short petioles, 5-nerved or when very narrow 3-nerved, with very numerous fine parallel transverse veinlets. Flowers 2 together in the axils, on filiform pedicels of 6 to 9 lines articulate above the middle, with a small lanceolate bract at their base. Perianth-segments narrow-

lanceolate, acute, 5-nerved, about ⅛-in. long. Filaments united in a short cup round the ovary. Anthers including the appendage nearly as long as the perianth, the connective thickened and rugose both at the back and in front between the narrow linear lateral cells, and produced beyond them into a long smooth linear appendage. Ovary ovoid, contracted at the end, with a very obtuse sessile stigma. Ovules not numerous. Fruit not seen.

N. Australia. Port Essington, *Armstrong*.
Queensland. Endeavour River, *Banks and Solander* (if correctly determined).

The Port Essington specimens agree with *P. javanica* in their alternate leaves and small flowers with narrow segments, and their segments are 5-nerved as described by Kunth, whilst in Teijsmann's Java specimens they are at least 7-nerved, and the flowers are only two together instead of several in a cluster. The leaves are not cordate, whilst Kunth describes them as deeply cordate, but in Teijsmann's specimens they are scarcely so. Banks and Solander's specimen is in leaf only, and was doubtfully referred by Brown to *Dioscorea* as *D. lucida*, Br. Prod. 295. It shows, however, the remarkable venation of *Roxburghia*, and is probably a form of *R. javanica*; the leaves (only the lower ones shown on the specimen) are broad, somewhat cordate, and 9-nerved.

ORDER CXXVII. LILIACEÆ.

Flowers hermaphrodite or rarely more or less diœcious, regular or rarely slightly oblique. Perianth inferior, with or without a distinct tube, the limb or whole perianth of 6 coloured or petal-like lobes or segments, imbricate in 2 series or the outer ones rarely valvate; all equal and similar, or the 3 inner ones rather larger or smaller or more united or occasionally broader and thinner than the 3 outer. Stamens usually 6, attached to the base of the lobes or segments or almost, rarely quite, hypogynous, or rarely slightly perigynous, the 3 opposite the outer segments often smaller, and in a few genera reduced to staminodia or deficient; filaments free or shortly united at the base; anthers erect or versatile, with 2 parallel cells opening inwards or laterally or rarely outwards, or by terminal pores. Ovary superior, 3-celled (imperfectly so in *Astelia*), with several often numerous, rarely only 1 or 2, ovules in each cell, amphitropous anatropous or rarely orthotropous, attached to an axile placenta. Style usually single with a small terminal stigma entire or obscurely 3-lobed, or in a few genera divided to the base or nearly so into 3 oblong or linear diverging or recurved stigmatic branches. Fruit either an indehiscent berry, or a capsule loculicidally or in a few genera septicidally opening in 3 membranous coriaceous or slightly fleshy valves, or rarely dividing into 3 indehiscent 1-seeded nutlets, in a few species reduced by abortion to 1 cell or nutlet. Seeds various, the testa frequently black, crustaceous or thin and adnate. Embryo small or linear, variously placed within a fleshy cartilaginous or hard albumen.—Perennial or rarely annual herbs with a short or tuberous or creeping rhizome, or (in genera not Australian) a bulbous base, or the stock growing up into a woody caudex, or the stems elongated branching shrubby or even arborescent or occasionally climbing. Leaves most frequently in radical tufts, or crowded at the ends of the caudex or branches, but sometimes spread along the branches, their sheathing bases distichous, or variously imbricated, or scattered, and often persistent after the blade has fallen away, the blade or lamina entire or minutely scabrous-denticulate, usually narrow with parallel veins, flat channelled or terete, rarely broad with distant primary veins and transverse veinlets. Scapes or flowering stems or peduncles terminal or rarely axillary, leafless or with 1 or 2 leaves below the inflorescence smaller than the lower ones, and passing into the bracts under the branches of the inflorescence or pedicels, which are usually reduced to small scales, and sometimes entirely wanting. Inflorescence variously branched or simple, usually centripetal, or reduced to a single terminal flower. Perianth usually glabrous, very variously coloured, often blue, as well as red, white, yellow, or purple.

The Order, like the *Amaryllideæ*, is generally distributed over the warmer and temperate regions of the globe; most abundant in dry sunny countries. Of the 40 genera here included, 4 are large genera widely distributed over the warmer regions of the Old World, more or less represented also in America, and 2 of them extending into more temperate regions; 3, although chiefly Australian, extend into tropical Asia, and two of them also to New Zealand; 4 are Australian representatives of South African genera, one of them extending into tropical Asia; 2, chiefly Australian, are also found in New Zealand or in the Pacific Islands; 2 belong to the New Zealand and Tasmanian alpine flora, 1 of them widely distributed over the extreme southern regions of the new as well as the old world; the remaining 24 are, as far as hitherto known, strictly endemic, a large proportion of them, however, consisting of only one or two species.

In working up this complicated and at first sight heterogeneous Order, I have been greatly assisted by Mr. Baker, whose views as to its comprehensiveness, as given in the series of monographs he is publishing in the Journal of the Linnean Society, I have mainly followed. The tribes and subtribes, however, which I have here characterised, are chiefly with reference to the Australian genera, a large proportion of which are strictly or nearly endemic, and would probably require a somewhat different arrangement in a general system of the whole Order, the limits of which are far from being definitively settled. Many botanists would distribute these Australian genera into 6 or 7 distinct Orders, whilst on the other hand the characters which separate them from *Junceæ* are by no means without exception. Generally speaking, they differ from *Amaryllideæ* in their free ovary, and from *Junceæ* by the petal-like consistency of both series of the perianth and with very few exceptions by the seeds.

SERIES I. **Baccatæ.**—*Fruit succulent or fleshy, indehiscent or rarely opening tardily in 3 valves.*

TRIBE I. **Smilaceæ.**—*Perianth-segments distinct, spreading. Anthers erect. Style deeply divided into 3 stigmatic branches. Embryo distant from the hilum. Albumen hard. Branching climbers. Leaves with distant primary veins, and transverse veinlets.*

Flowers diœcious, in sessile or pedunculate umbels . . . . 1. SMILAX.
Flowers hermaphrodite, in racemes either simple and axillary
or terminal and paniculate . . . . 2. RHIPOGONUM.

TRIBE II. **Flagellarieæ.**—*Perianth-stamens, style and embryo of* Smilaceæ. *Albumen mealy. Leaf veins all parallel and numerous.*

Flowers hermaphrodite. Climbers. Leaves ending in a
twisted point . . . . 3. FLAGELLARIA.

TRIBE III. **Astelieæ.**—*Perianth-segments distinct, spreading. Anthers erect. Styles or stigmas very short, distinct. Tufted herbs. Leaf-veins parallel.*

Flowers diœcious, in terminal racemes or panicles . . . . . 4. ASTELIA.

TRIBE IV. **Drymophileæ.**—*Perianth-segments distinct, spreading. Anthers erect.*

Style deeply divided into 3 stigmatic branches. Embryo near the hilum. Perennials with leafy stems. Leaf-veins all parallel.

Flowers hermaphrodite, axillary, solitary or 2 together . . . 5. DRYMOPHILA.

TRIBE V. **Asparageæ.**—*Perianth-segments distinct, spreading. Style undivided.*

Perianth persistent. Filaments abruptly thickened under the anther. Anthers erect, opening in terminal pores. Habit of *Anthropodium* (sub-tribe **Dianelleæ**) . . . . 6. DIANELLA.

Perianth deciduous. Filaments not thickened. Anthers opening in longitudinal slits. Leafy stems elongated and branched (sub-tribe **Euasparageæ**).

Cladodes (or leaves) clustered, subulate. Flowers axillary. Anthers versatile. Ovules 2 or very few in each cell . . 7. ASPARAGUS.

Leaves flat, solitary. Anthers erect. Ovules several in each cell. Tall climbers.

Flowers axillary, pedicellate. Inner perianth-segments fringed . . . . 8. EUSTREPHUS.

Flowers in loose terminal cymes. Inner perianth-segments entire . . . . 9. GEITONOPLESIUM.

TRIBE VI. **Dracæneæ.**—*Perianth gamophyllous, at least at the base, deciduous. Anthers versatile. Style undivided. Stems woody, sometimes arborescent. Flowers paniculate.*

Ovules solitary in each cell. Fruit pulpy, indehiscent . . . 10. DRACÆNA.

Ovules several in each cell. Fruit fleshy, often at length 3-valved . . . . 11. CORDYLINE.

SERIES II. **Capsulares.**—*Fruit dry, capsular or rarely of* 1 *to* 3 *indehiscent* 1-*seeded nutlets.*

TRIBE VII. **Hemerocallideæ.**—*Perianth gamophyllous, tubular or campanulate. Style undivided. Stock not bulbous.*

Ovary stipitate, with numerous ovules in each cell. Capsule septicidally 3-valved. Leaves crowded at the base of the stem. Flowers large, pendulous, in a terminal raceme . 12. BLANDFORDIA.

TRIBE VIII. **Melanthaceæ.**—*Perianth-segments free or shortly united at the base, rarely to the middle. Style more or less divided into* 3 *stigmatic branches or short distinct styles. Stock not at all or scarcely bulbous. Anthers frequently turned outwards.*

Stamens 3 opening outwards and equitant leaves of *Irideæ* (sub-tribe **Hewardiæ**) . . . . 13. HEWARDIA.

Stamens 6, perianth-segments united or imbricate at the base. (sub-tribe **Anguillarieæ**).

Perianth persistent, the segments shortly united at the base. Flowers paniculate . . . . 14. MILLIGANIA.

Perianth persistent, the segments more or less united at the base. Flowers solitary or simply spicate . . . . . 15. WURMBEA.

Perianth persistent, the segments quite distinct. Flowers simply spicate . . . . 16. ANGUILLARIA.

Perianth-segments separately deciduous. Flowers few. Inflorescence simple . . . . 17. IPHIGENIA.

Stamens 6. Perianth-segments quite free, deciduous, induplicate or convolute round the opposite stamens in the bud. (sub-tribe **Burchardieæ**).

Capsule loculicidally 3-valved. Leaves ovate or lanceolate.

Flowers solitary or few in a terminal umbel. Perianth-segments without appendages . . . . 18. SCHELHAMMERA.

Flowers solitary or few in axillary peduncles. Perianth-segments with glandular appendages at the base . . 19. KREYSIGIA.

Capsule septicidally 3-valved. Leaves few, linear. Flowers several in a terminal umbel . . . . 20. BURCHARDIA.

TRIBE IX. **Anthericeæ.**—*Perianth-segments free or very shortly united at the base.*

Style undivided, with a small terminal entire or slightly 3-dymous stigma. Stock not bulbous. Flowers racemose paniculate or umbellate, rarely solitary. Bracts thinly scarious usually hyaline or none, not glumelike.

Perianth deciduous, not twisted (sub-tribe **Phalangieæ**).

Filaments bearded. Raceme simple . . . . 21. BULBINE.

Perianth spirally twisted over the ovary after flowering, at length deciduous (sub-tribe **Cæsieæ**).

Capsule 3-valved. Filaments glabrous.

Anthers 6, opening in terminal pores. Base of the perianth truncate and persistent. Raceme simple or once branched . . . . 22. AGROSTOCRINUM.

Anthers 6 or 3, the cells opening longitudinally, but the outer valve produced beyond the inner. Inner perianth-segments fringed, enclosing the inner stamens in the bud. Umbels usually 2 or more flowered . . . . 23. THYSANOTUS.

Anthers 3, cohering in a tube round the style, 3 free staminodia. Raceme simple . . . . 24. HODGSONIOLA.

Anthers 6, free, opening in slits.

Ovules 2 in each cell. Capsule obtuse-angular. Seeds globular. Umbels or clusters in a simple raceme. 25. CÆSIA

Ovules several in each cell. Capsule acutely angled or lobed. Seeds flattened. Flowers corymbose or paniculate . . . . 26. CHAMÆSCILLA.

Nutlets 1-seeded, indehiscent. Anthers 6, opening in slits.

Filaments glabrous. Nutlets solitary. Flowers minute, solitary or 2 together along the rigid branchlets . . . . 27. CORYNOTHECA.

Filaments bearded or woolly. Nutlets usually 2 or 3. Umbels terminal . . . . 28. TRICORYNE.

Perianth not twisted, persistent round the fruit, unchanged or withering (sub-tribe **Chlorophyteæ**).

Flowers loosely racemose cymose, or paniculate. Anthers 6, opening in slits.

Filaments bearded or with adnate appendages under the anther.

Anthers recurved after flowering. Seeds flattened. Flowers in a very loose cyme . . . . 29. STYPANDRA.

Anthers not recurved. Seeds angular. Flowers loosely racemose . . . . 30. ARTHROPODIUM.

Filaments glabrous. Anthers with basal crests. Seeds angular. Flowers loosely racemose . . . . . . 31. DICHOPOGON.

Stamens without beards or appendages. Capsule acutely 3-angled or 3-lobed. Seeds flattened. Flowers racemose . . . . 32. CHLOROPHYTON.

Flowers large, solitary, almost sessile within a tuft of radical leaves. Anthers 6, opening in slits . . . . 33. HERPOLIRION.

Flowers numerous, in umbels, with numerous scarious imbricate bracts.

Anthers 3, divided into 2 long erect lobes. Umbels terminal . . . . 34. SOWERBYA.

Anthers 6, small, ovate. Umbels on axillary peduncles. 35. ALANIA.

Tribe X. Johnsonieæ.—*Perianth-segments free or united in a tube at the base. Style filiform, with a terminal entire stigma. Stock not bulbous. Flowers in dense heads or short spikes, solitary and sessile, or nearly so, within imbricate bracts.*

Perianth-segments free or the inner ones shortly united.

Flower-heads globular. Bracts scarious.

Anthers 6. Flowers uniform . . . . 36. LAXMANNIA.

Anthers 3. Flowers dimorphous in the same head . . 37. STAWELLIA.
Spikes oblong. Bracts glumaceous . . . . 38. JOHNSONIA.
Perianth hypocrateriform, with a cylindrical tube and equally spreading 6-lobed limb.
Anthers 3, connate round the style. Ovules 2 in each cell . . . . 39. ARNOCRINUM.
Anthers 6, distinct. Ovules several in each cell . . . 40. BORYA.

SERIES I. BACCATÆ.—Fruit succulent or fleshy, indehiscent or rarely opening tardily in 3 valves.

TRIBE I. SMILACEÆ.—Perianth-segments distinct, spreading. Anthers erect. Style deeply divided into 3 stigmatic branches. Embryo distant from the hilum. Albumen hard.—Branching climbers. Leaves with distant primary veins and transverse veinlets. Berry indehiscent.

1. SMILAX, Linn.

(Coprosmanthus, *Kunth.*)

Flower diœcious. Perianth deciduous, of 6 distinct spreading segments, all equal, or in species not Australian the 3 outer ones larger or united at the base, or the 3 inner ones wanting. Stamens 6, or in a few species not Australian 3, inserted at the base of the segments, filaments filiform or very short; anthers oblong, the 2 parallel cells separated by a scarcely prominent dissepiment, and when open apparently 1-celled; the stamens all rudimentary only in the female flowers. Ovary rudimentary or entirely deficient in the male flowers, sessile in the females, 3-celled, with 1, or rarely 2, erect ovules in each cell. Style very short, divided to the base or nearly so into 3 oblong usually recurved stigmatic lobes. Fruit a globular berry, usually ripening only 1 or 2 thick seeds without strophioles. Testa thin but hard, smooth and shining, closely appressed to the hard albumen. Embryo either very small or half the length of the albumen, distant from the hilum.—Branching climbers, the stems and main branches hard, often armed with scattered prickles. Leaves ovate orbicular or narrow, usually coriaceous and shining, with transverse or reticulate veins between the longitudinal nerves, marked with numerous small transparent dots, intermixed sometimes with larger oblong ones; the petioles usually short, bearing on each side a simple tendril, sometimes reduced to a short point, and more or less winged below the tendrils. Flowers small, white or pale green or purple; pedicellate in sessile or pedunculate umbels, which are either solitary in the axils, or several in axillary or terminal panicles. Bracts in the umbel very small, imbricate, with one pedicel in each axil.

A large genus, dispersed over the tropical and temperate regions both of the new and the old world. The Australian species are both endemic, though they are nearly allied to corresponding Asiatic species.

Perianth-segments broad, scarcely above 1 line long. Filaments shorter than the anthers . . . . 1. *S. glycyphylla.*
Perianth-segments narrow, 1½ to 2 lines long. Filaments rather longer than the anthers . . . . 2. *S. australis.*

1. **S. glycyphylla,** *Sm. in White, Voy.* 230.—Glabrous and quite unarmed. Leaves lanceolate or ovate-lanceolate, 1½ to 3 in. long or rarely more, acute or acuminate, narrowed or rounded at the base or rarely almost cordate, 3-nerved, rigid, often very glaucous or white underneath, but sometimes equally green on both sides; the petioles twisted, short but slender, bearing slender tendrils, but not at all or scarcely winged below them. Peduncles axillary and simple, or a few of the upper ones in a terminal panicle. Pedicels rarely 3 lines long. Perianth nearly globular in the bud, the outer segments broadly ovate, scarcely above 1 line long. Anthers almost sessile, very much shorter than the perianth. Female flowers not seen. Berry the size of that of *S. australis.*—R. Br. Prod. 293; Endl. Iconogr. t. 39; F. Muell. Fragm. vii. 77.

Queensland. Rockhampton, *Bowman*; Rockingham Bay, *Dallachy.*
N. S. Wales. Port Jackson, *R. Brown* and others; New England, *C. Stuart;* Hastings and Macleay Rivers, *Beckler;* Clarence River, *C. Moore.*

2. **S. australis,** *R. Br. Prod.* 293.—A glabrous climber, ascending sometimes to a considerable height, the stems and branches usually more or less armed with scattered prickles, of which, however, some specimens show none at all, or here and there only a very minute one. Leaves from ovate-lanceolate or oblong to nearly orbicular, 2 to 4 in. long, or rarely much larger; usually 5-nerved, but the outer nerve on each side often short or irregular, and sometimes scarcely distinguishable from the reticulate veins, the petioles short and twisted, narrowly or scarcely winged below the tendrils. Umbels many-flowered, on axillary peduncles usually simple and ½ to ¾ in. long, but sometimes longer slightly branched and bearing 2 or 3 umbels. Pedicels filiform, 2 to 4 lines long. Perianth oblong when in bud, the segments narrow, 1½ to nearly 2 in. long. Filaments in the male flowers rather longer than the anthers, which are oblong and at length recurved; in the female flowers the filaments are usually present, but without anthers. Ovary entirely deficient in the males, sessile with 1 ovule in each cell in the females. Berry black, globular, about 4 lines diameter, with 1 globular seed or 2 flattened on their inner faces. Embryo often at least half as long as the albumen.—F. Muell. Fragm. vii. 78; *S. latifolia* and *S. elliptica,* R. Br. Prod. 293; *S. spinescens,* Miq. in Linnæa, xviii. 83.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown,* Goulburn Islands, *A. Cunningham;* Port Darwin, *Schultz, n.* 737; Liverpool River, *Gulliver.*
Queensland. Brisbane River, Moreton Bay, *A. Cunningham, F. Mueller,* and others; Rockingham Bay, *Dallachy;* Cape York, *M'Gillivray.*
N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and many others; northward to New England, *C. Stuart;* Hastings, Clarence, Macleay, and Richmond Rivers, *Beckler, Wilcox, Henderson,* and others; southward to Illawarra, *A. Cunningham;* and Twofold Bay, *F. Mueller;* Lord Howe's Island, *C. Moore.*
Victoria. Snowy River and other localities in eastern Gipps' Land, *F. Mueller* and others.

The species seems nearly allied in many respects to the East Indian *S. ovalifolia,* Roxb. which, however, has the leaves usually much larger, with broad wings to the petioles and the peduncles more branched. *S. China*, Linn., from China and Japan, is also at first sight very like the broad-leaved forms of *S. australis*, but has usually, if not always, 2 ovules to each cell of the ovary. Of R. Brown's species, *S. elliptica* is referred here from his short diagnosis agreeing well with some of the N. S. Wales specimens of *S. australis*, no specimen being preserved in his herbarium; his *S. latifolia*, from the Carpentaria Islands, is a broad-leaved form, precisely similar to some of our Arnhem's Land specimens, but without any prickles at all on the rather large specimens in Brown's herbarium. In other specimens, however, of several forms of this variable species, the prickles are so few and minute that they can only be detected by a very careful search. In others the prickles are numerous, and some of them thick and long, mixed with small ones.

Alph. de Candolle, who has in the press a very carefully prepared and studied monograph of Smilaceæ, in which he has brought out several characters hitherto neglected, distinguishes the northern *S. latifolia* Br. from the common *S. australis*, in that the former has the tendril from one-third to half-way up the petiole, which twists and finally disarticulates at some distance from the lamina, and has oblong or linear transparent dots on the leaf mixed with the ordinary small ones, whilst in *S. australis* the tendril is from half to two-thirds up the petiole, which disarticulates close to the lamina, and has only the ordinary small dots. But after carefully comparing his notes with the specimens before me from above thirty different stations, I find the greatest diversity in the proportionate lengths of the lower and upper parts of the petiole, and the exact place where the lamina breaks off; the dotting of the leaves would at first sight appear a more important character, but a further investigation prevents any use being made of it, at least in as far as our herbarium specimens show. In some Cape York specimens, with the leaves otherwise resembling some of the common N. S. Wales forms, the large oblong dots are rather numerous, the small round ones very few. In our Port Darwin ones, from Schultz, the oblong dots are few and much smaller, whilst the small round ones are very numerous. In the majority of the northern ones the small round ones are usually but not near always without any oblong ones. Herbarium specimens, however, are generally very imperfect, and rarely give males and females, flowers and fruits from the same stations; and it is very possible that a study of the living plants may show good characters for distinct varieties if not for permanent species.

2. RHIPOGONUM, Forst.

Flowers hermaphrodite. Perianth deciduous, of 6 distinct spreading segments, all equal or the outer ones shorter and often, but not always, surrounded by 2, 3, or even 4 small bracts. Stamens 6, hypogynous; filaments short, somewhat flattened; anthers sagittate, erect, nearly as long as the perianth. Ovary sessile, 3-celled, tapering at the top into a very short style, divided into 3 thick recurved stigmatic lobes; ovules solitary in each cell, pendulous, orthotropous or nearly so. Fruit a globular berry, usually ripening 1 globular seed, or sometimes 2 or 3 seeds variously flattened, with a large hilum, without any strophiole. Testa thin, light brown, closely adnate to the hard albumen. Embryo small, at a distance from the hilum.—Tall branching climbers. Leaves often mostly opposite or nearly so, but sometimes all alternate, 3 or 5-nerved, with transverse reticulate veins, the petioles without wings or tendrils. Flowers sessile or shortly pedicellate, in racemes either simple and axillary or the upper ones forming a terminal leafless panicle.

Besides the four Australian species, which are all endemic, there is one in New Zealand.

Glabrous. Leaves narrowed into a distinct twisted petiole.
  Leaves mostly 3 to 4 in., not above twice as long as broad. Flowers usually pedicellate . . . . . . 1. ***R. album.***
  Leaves mostly 6 to 8 in., three times as long as broad. Flowers usually sessile . . . . 2. ***R. discolor.***
More or less pubescent. Leaves rounded or cordate at the base and nearly sessile.
  Leaves 2 to 3 in. long. Ovary glabrous . . . . . . 3. ***R. Fawcettianum.***
  Leaves 3 to 6 in. long. Ovary densely villous . . . . 4. ***R. Elseyanum.***

1. **R. album,** *R. Br. Prod.* 293.—A tall glabrous climber, the principal branches often covered with prickles, the smaller ones usually without any, or only with a few small ones. Leaves irregularly opposite or alternate, on short twisted petioles, elliptical or oblong, varying to ovate or almost lanceolate, shortly acuminate, narrowed at the base, mostly 3 to 4 in. long, though occasionally nearly twice as long or under 3 in.; coriaceous, 3- or 5-nerved, the intermediate reticulate veins prominent. Racemes axillary, simple, shorter or scarcely longer than the leaves, a few of the upper ones sometimes forming a terminal leafless panicle. Flowers usually distant along the rhachis, at first nearly sessile, but the pedicels growing out to 2 or 3 lines, or sometimes pedicellate from the first. Perianth 3 to 4 lines long. Ovary glabrous. Berry 4 to 5 lines diameter, said to be red when fresh, drying black. —Kunth, Enum. v. 272; F. Muell. Fragm. vii. 79; *R. Mooreanum*, F. Muell. Fragm. i. 44.

Queensland. Brisbane River, Moreton Bay, *A. Cunningham*, *F. Mueller*, and others; Rockhampton, *Dallachy* and others.

N. S. Wales Port Jackson to the Blue Mountains, *R. Brown*, *Woolls*, and others; northward to New England, *C. Stuart*; Hastings, Clarence, and Richmond Rivers, *Beckler* and others; southward to Twofold Bay, *F. Mueller*.

Victoria. Snowy River, eastern Gipps' Land, *F. Mueller*.

Var. *leptostachya*. Racemes slender, often branched, but with few flowers on slender pedicels of 3 to 4 lines.

Queensland. Rockingham Bay, *Dallachy*.

2. **R. discolor,** *F. Muell. Fragm.* vii. 78.—A stout glabrous climber, nearly allied to *R. album*, with similar prickly or smooth branches. Leaves oblong or lanceolate, 6 to 8 in. long, and rarely above 2 in. broad, rounded or narrowed into a twisted petiole at the base, much thicker than in *R. album*, the transverse reticulate veins much fewer and not so fine. Racemes axillary, 4 to 6 in. long, the flowers sessile or nearly so. Perianth-segments rather shorter and broader than in *R. album*. Ovary glabrous.

N. S. Wales. Hunter's River, *A. Cunningham*; Clarence River, *Beckler*; New England, *Parrott*; Tweed River, *Guilfoyle*.

3. **R. Fawcettianum**, *F. Muell. Herb.*—Branches slender, without prickles, sprinkled with a loose rufous pubescence. Leaves on very short petioles or almost sessile, lanceolate or ovate-lanceolate, acuminate,

cordate at the base, 2 to 3 in. long, 3- or 5-nerved. Racemes axillary, slender but many-flowered. Flowers shortly pedicellate, rather smaller than in *R. album.* Filaments slender, as long as the anthers. Ovary glabrous.

N. S. Wales. Richmond River, *Fawcett;* Macleay River, *Fitzgerald.*

4. **R. Elseyanum,** *F. Muell. Fragm.* i. 44, vii. 80.—A stout climber, the branches leaf-nerves and rhachis of the racemes clothed with a loose brown pubescence, the main stems said to be prickly as in other species, although our specimens are entirely unarmed. Leaves on very short petioles or almost sessile, elliptical oblong or ovate, 3 to 6 lines long, acuminate, rounded or cordate at the base, of a thick texture, 3- or 5-nerved, but the lateral nerves starting from the midrib considerably above the base so as to be almost penninerved. Racemes axillary, about as long as the leaves. Flowers rather large, closely sessile or very shortly pedicellate. Perianth-segments oblong. Anthers long, on short filaments as in *R. album,* but the ovary very densely villous, contracted into a very short thick style, with closely adnate recurved stigmatic lobes. Ovules and fruit of *R. album.*

N. S. Wales. Archer's Station, *Leichhardt;* New England, *C. Stuart;* Richmond River, *Henderson.*

Tribe II. Flagellarieæ.—Perianth, stamens, style and embryo of *Smilaceæ.* Albumen mealy. Leaf-veins all parallel and numerous. Drupe indehiscent.

3. FLAGELLARIA, Linn.

Perianth persistent, of 6 distinct nearly equal spreading segments, thin but coloured, the 3 inner ones rather larger. Stamens 6, hypogynous; filaments short, free; anthers erect, exceeding the perianth, the cells opening laterally in longitudinal slits. Ovary sessile, 3-celled, with 1 laterally attached ovule in each cell; style deeply divided into 3 linear-clavate stigmatic lobes. Fruit a small nearly globular indehiscent drupe, the exocarp thin, slightly succulent, the endocarp hard and long, 1- or rarely 2-celled, with 1 seed in each cell. Seed globular, with a thin membranous testa closely lining the endocarp, and a copious mealy albumen. Embryo small, broadly clavate, at a distance from the hilum. —Leafy climbers, with long leaves ending in a spirally twisted point. Flowers small, in a terminal panicle.

Besides the widely spread species here described, there appears to be a second one in the Feejee Islands, different, however, from the *F. plicata,* Hook. f., which is the *Joinvillea,* Gaud., not nearly so closely allied to *Flagellaria* as had been supposed.

1. **F. indica,** *Linn.: Kunth. Enum.* iii. 370.—A tall glabrous climber, ascending sometimes to the top of large trees, the branches encased at the base in the closed leafsheaths. Leaves long-lanceolate or linear-lanceolate, from 4 or 5 in. long to twice that length, besides the long

points spirally twisted into tendrils, variable in breadth, many-nerved but not plicate, rounded at the base and almost petiolate on the sheath which ends on each side in a short rounded auricle. Flowers white, very numerous, sessile in clusters or short spikes on the ultimate small branches of a dense terminal panicle, with a small scale-like bract under each flower and under the smaller branches. Perianth-segments about 1 line long. Fruit about 2 lines diameter.—Red. Lil. v. t. 257; Schnitzl, Iconogr. i. t. 51. b; R. Br. Prod. 264.

N. Australia. Port Essington, *Armstrong*; Point Pearce, *F. Mueller; Escape* Cliffs and Adams Bay, *Hulse.*

Queensland. Northumberland and Prince of Wales Islands, *R. Brown*; islands along the coast, *A. Cunningham*; Cape York, *M'Gillivray*, *Daemel*; Rockingham Bay, *Dallachy*; Rockhampton, *O'Shanesy*, *Bowman*, and others; Moreton Bay, *Eaves.*

N. S. Wales. Hastings and Clarence Rivers, *Beckler*; Port Macquarrie, *Tozer*; Richmond River, *Henderson*; Lord Howe's Island, *Fullagar.*

The species extends over the tropical regions of Asia and Africa.

TRIBE III. ASTELIEÆ.—Perianth-segments distinct, spreading. Anthers erect. Styles or stigmas very short, distinct. Tufted herbs. Leaf-veins parallel. Berry indehiscent.

4. ASTELIA, Banks.

Flowers diœcious or nearly so. Perianth persistent, divided nearly or quite to the base into 6 equal spreading membranous segments. Stamens 6, attached to the base of the segments and shorter than them; filaments scarcely dilated; anthers ovate, erect or almost versatile, opening laterally or almost inwards in longitudinal slits, the stamens in the females reduced to small clavate staminodia. Ovary abortive or rudimentary in the males, sessile in the females, either 1-celled with 3 parietal placentæ, or more or less perfectly 3-celled with axile placentæ; ovules numerous to each placenta; style divided to the base or nearly so into 3 short stigmatic branches. Fruit a globular or oblong indehiscent berry. Seeds several, ovoid or angular, with a black shining crustaceous testa. Embryo small, near the base of the fleshy albumen. —Densely tufted herbs, more or less clothed with long silky or almost paleaceous hairs. Leaves crowded at the base of the stem, with broad imbricate sheaths. Flowers in terminal racemes or panicles, reduced in one or two dwarf species to 2 or 3 almost sessile flowers.

Besides the Australian species, which is endemic, there are several others spread over New Zealand, the Antarctic regions, and the southern extremity of America, growing sometimes in bogs or on mountain-tops, sometimes on the trunks of trees. For the remarkable diversity in different species in the placentation of the ovary and the seeds, see Hook. f. Fl. Ant. ii. 357.

1. **A. alpina,** *R. Br. Prod*, 291.—Leafy base of the stem very short, densely tufted, the long broad sheathing bases of the leaves densely covered with very long white silky hairs. Leaves from a few inches to 1 foot long, 3 to 5 lines broad, or in very luxuriant specimens attaining

a breadth of 8 or 9 lines, the silky hairs of the upper portion very short and less apparent, but seldom quite wanting. Scapes very much shorter than the leaves, bearing a pyramidal panicle of 2 to 3 in. and loosely branched in the males, dense compact and very short in the females, with 1, 2, or 3, leafy bracts under the lower branches in both sexes. Perianth segments about 2½ lines long and very spreading in the males, more erect and 3 lines long in the females. Ovary oblong, contracted at the end, with 3 very short obtuse stigmatic lobes, 1-celled, with few ovules on 3 parietal placentæ. Berry ovoid-oblong, under 1 in. long, surrounded by the somewhat enlarged persistent perianth. Seeds globular.—Hook. f. Fl. Tasm. ii. 60; *A. psychrocharis*, F. Muell. in Hook. Kew Journ. viii. 332.

Victoria. Mount Wellington in Gipps' Land, and in the Baw-Baw Mountains, at an elevation of 4000 to 5000 ft., *F. Mueller*.

Tasmania. Table Mountain, *R. Brown*; abundant on all the mountains, *J. D. Hooker* and others.

TRIBE IV. DRYMOPHILEÆ.—Perianth-segments distinct, spreading. Anthers erect. Style deeply divided into 3 stigmatic branches. Embryo near the hilum. Perennials with leafy stems. Leaf-veins all parallel. Berry indehiscent.

5. DRYMOPHILA, R. Br.

Perianth deciduous, of 6 distinct equal segments lanceolate and spreading or almost reflexed. Stamens 6, hypogynous, not exceeding the perianth and sometimes much shorter; filaments filiform; anthers oblong, erect, attached between the short basal lobes, the cells opening in longitudinal slits. Ovary sessile, short, 3-celled, with several often many ovules in each cell superposed in 2 rows. Styles 3, linear, slightly flattened, recurved, apparently stigmatic from near the base. Fruit a globular or ovoid berry. Seeds globular or variously shaped by mutual pressure; testa thickly membranous or almost crustaceous, adnate to the hard albumen; embryo short.—Perennials with simple or slightly branched leafy stems. Leaves distichous, spreading, sessile or nearly so. Flowers solitary or rarely 2 together in the axils, articulate on recurved pedicels, without bracts.

The genus is limited to Australia.

Berry blue, globular. Seeds 8 to 20, with a smooth brown testa . . . . 1. *D. cyanocarpa.*
Berry orange, ovoid. Seeds 3 or 4, with a very pale-coloured minutely-wrinkled testa . . . . 2. *D. Moorei.*

1. **D. cyanocarpa,** *R. Br. Prod.* 292.—Stems usually about 1 foot high, simple or with a few divaricate branches in the upper part, with a few brown sheathing scales in the lower leafless part. Leaves sessile or nearly so, lanceolate or almost oblong, varying from 1 to 3 in. in length, marked with numerous prominent nerves. Flowers white, the pedicels varying from scarcely above 1 line to nearly ½ in., spreading or

recurved. Perianth-segments usually about 3 lines long, but varying in size, marked with from 3 to 7 longitudinal veins. Berry blue, nearly globular, from 4 to 6 lines diameter. Seeds usually 8 to 20, with a smooth brown testa.—Baker in Journ. Linn. Soc. xiv. 571; F. Muell. Fragm. vii. 73; Hook, f. Fl. Tasm. ii. 49.

N. S. Wales. Hastings River, *Fraser*; Macleay River, *Fitzgerald.*
Victoria. Mount Warrenip, *Wilhelmi*; Skipton, *Whan*; Mount Macedon, *Walter*; Cape Otway Ranges, *F. Mueller.*
Tasmania. Table Mountain, *R. Brown*; abundant in grassy shaded places amongst fern, &c., *J. D. Hooker.*

3. **D. Moorei,** *Baker in Journ. Linn. Soc.* xiv. 571.—Closely resembles *D. cyanocarpa* in habit and stature, but the leaves are broader, from almost ovate to oblong-lanceolate. Flowers apparently similar. Berry ovoid, said to be orange-coloured, about ½ in. diameter, with only 3 or 4 seeds fully twice the diameter of those of *D. cyanocarpa*, the testa very pale coloured, thin or more or less wrinkled. How far these differences prove constant remains to be proved.—*D. pyrrhocarpa*, F. Muell. Fragm. ix. 190.

N. S. Wales. Hastings and Macleay rivers, *C. Moore*; Clarence River, *Wilcox.*

TRIBE V. ASPARAGEÆ.—Perianth-segments distinct, spreading. Style undivided. Berry indehiscent or very tardily dry and 3-valved.

6. DIANELLA, Lam.

Perianth persistent, of 6 distinct oblong segments, either equal in length or the 3 inner ones rather shorter, all with thin margins, and 3 to 5 rarely 6 or 7 parallel veins more or less approximate in the centre. Stamens 6, 3 opposite the outer segments hypogynous, 3 more or less adhering to the base of the inner segments; filaments abruptly thickened at the apex or nearly to the base; anthers erect, the cells opening in terminal pores often continued in longitudinal slits sometimes nearly to the base. Ovary sessile, short, 3-celled, with several superposed ovules in each cell; style filiform, with a terminal somewhat capitate stigma, entire or slightly 3-furrowed. Fruit a blue indehiscent berry. Seeds few, variously shaped, with a black testa coriaceous smooth and shining, a white waxy albumen and small embryo.—Glabrous perennials, with thick fibrous roots, the stock often stoloniferous or slightly branched. Scapes or stems erect, rigid, often several feet high. Leaves crowded at the base of the stems or more or less spread on the lower part, distichous and sheathing at the base, with a long lamina, a few upper ones reduced to short sheaths and a small erect lamina. Flowers blue, pedicellate, nodding, in loose dichotomous cymes collected in a terminal panicle. Bracts at the base of the pedicels small and scarious or none. Pedicels articulate close under the flower.

The genus is chiefly Australian, but extends in a very few species to tropical Asia, the Mascarene and Pacific Islands, and New Zealand. Of the five Australian species one is a common Asiatic one, the other four are endemic. In their typical forms the five are very distinct, but they are all so variable and connected by so many intermediates that I have found it very difficult to distribute satisfactorily the numerous dried specimens before me. It is not impossible, however, that a careful study of living plants in their native country may disclose more positive characters to distinguish even twice as many more or less permanent forms.

Leaves radical or nearly so, very shortly sheathing the base of the stem.
Anthers shorter than the filament, which is thickened from below the middle. Leaves long and broad . . 1. *D. tasmanica.*
Anthers longer than the filament, which is thickened only above the middle.
Leaves narrow, usually long and nearly flat, the sheathing base scarcely keeled . . . . 2. *D. lævis.*
Leaves long, narrow, rigid, with the margins much revolute, the sheathing base keeled . . . . . 3. *D. revoluta.*
Stem often branching at the base and more or less leafy, the sheathing base of the leaves laterally flattened and acutely keeled. Anthers longer than the filament.
Leaves narrow, mostly under ½ in. broad . . . . . . 4. *D. cærulea.*
Leaves ½ to 1 in. broad . . . . 5. *D. ensifolia.*

1. **D. tasmanica,** *Hook. f. Fl. Tasm.* ii. 57, *t.* 133.—Stems attaining sometimes 4 or 5 ft. though often shorter. Leaves distichous and crowded at the base of the stem, usually 1 to 2 feet long and ¼ to nearly 1 in. broad, the margin and midrib scabrous, those on the stem reduced to a few short distant sheaths with short erect laminæ or points. Panicle often above 1 ft. long, the cymes loose, with recurved pedicels. Perianth-segments about 3½ lines long, all usually 5-nerved, or the outer ones sometimes with 6 or 7 or the inner with only 3 nerves. Filaments much thickened from below the middle or almost from the base, and usually longer than, often twice as long as, the oblong anther. Berry globular or ovoid-oblong, about ½ in. long.—Baker in Journ. Linn. Soc. xiv. 575; F. Muell. Fragm. vi. 121; Bot. Mag. t. 5551.

Victoria. Mount Baw-Baw and Cape Otway, *F. Mueller.*
Tasmania. Common in rich moist soil, *J. D. Hooker.*

D. Archeri, Hook. f. Fl. Tasm. ii. 58, appears to be scarcely even a distinct variety, nor can I well separate *D. Hookeri*, Baker, l. c. (*D. lævis*, Hook. f. l. c. 57, not of Br.). *D. densa*, Lindb. in Act. Soc. Sc. Fenn. x. 132, t. 6, is also referred to this species by Baker. *D. angustifolia*, Schult. Syst. vii. 352, described from a Tasmanian specimen in Martius' herbarium, is most probably a narrow-leaved form of *D. tasmanica.*

2. **D. lævis,** *R. Br. Prod.* 280.—Stems varying from under 1 ft. in some of the inland specimens to 2 or 3 ft. in luxuriant ones from Queensland. Leaves usually few at the base of the stem, the short sheathing base rounded on the back or only slightly compressed and scarcely keeled, the blade in the typical specimens very long and narrow, often above 2 ft. long and ¼ to nearly ½ in. broad, flat or with scarcely recurved margins when dry, the edges smooth or slightly scabrous; in the smaller inland specimens the leaves are much shorter than the stem

and spreading or recurved. Panicle varying from loose and spreading to narrow with the cymes contracted into short clusters. Perianth-segments 3 to 4 or rarely 5 lines long, all 5-nerved or the inner ones only 3-nerved. Filaments with the thickened apex much shorter than either the filiform base or the oblong-linear anther, which varies from 1½ to 2 lines long. Berry globular, smaller than in *D. tasmanica*.—Baker in Journ. Linn. Soc. xiv. 577; *D. longifolia*, R. Br. Prod. 280; F. Muell. Fragm. vi. 122. *D. strumosa*, Lindl. Bot. Reg. t. 751.

Queensland. Various localities from Moreton Bay to Rockhampton, but apparently not abundant, *A. Cunningham*, *F. Mueller*, and others; Keppel Bay to Northumberland Islands, *R. Brown*, all the long-leaved forms.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Miss Atkinson*, and others; New England, *C. Stuart*, including a slender variety with the leaves not 2 lines broad.

Victoria. On the Yarra, *F. Mueller*.

Tasmania. Some specimens from South Esk River, *C. Stuart*, in Herb. F. Mueller, appear to belong to this species, besides those referred by *F. Mueller* to *D. elegans*.

S. Australia. Lofty Range, *Wirth*; Barossa Range, *F. Mueller*.

Var. *aspera*. Leaves usually short, spreading, rigid, and often, but not always, scabrous on the edges and midribs. *D. elegans*, F. Muell. Fragm. vi. 122, but scarcely of Kunth, who describes the anthers as brown, whilst they appear to be always yellow in *D. lævis*.

D. rara, R. Br. Prod, 280, from Shoal Bay, *R. Brown*, appears to me, from the imperfect specimen in his herbarium, to be a slender starved state of *D. lævis*.

3. **D. revoluta,** *R. Br. Prod.* 280.—Leaves distichous and crowded at the base of the stem as in *D. tasmanica*, the sheaths with prominent keels, two or three outer ones with scarcely any or very short laminæ, the inner ones with narrow rigid blades often 2 or 3 ft. long, with the margins closely revolute over the midrib, leaving a deep furrow on the upper side, the edges and midrib scabrous or smooth. Panicle when fully out looser and more spreading with larger flowers more deeply coloured than in *D. cærulea*. Perianth, especially in the southern specimens, often above 4 lines long, usually smaller in the northern ones. Anthers considerably longer than the filaments, of which the thickened apex is usually very short. Berries small, globular.—Baker in Journ. Linn. Soc. xiv. 578; F. Muell. Fragm. vi. 121; *D. divaricata*, R. Br. Prod. 280; Baker, l. c.; *D. longifolia*, Bot. Reg. t. 734, not of R. Br.

Queensland. Upper Burnett River, *F. Mueller*; Rockhampton, *O'Shanesy*, *Bowman*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, *n.* 198; Hastings River, *Beckler*; Nurrum-Nurrum, *Leichhardt*.

Victoria. Common in dry districts, especially near the sea-coast, *F. Mueller*, *Robertson*, and others.

S. Australia. Round Spencer's and St. George's Gulfs, *F. Mueller*, *Blandowski*, and others.

W. Australia. King George's Sound, *R. Brown*, *F. Mueller*, and others; and thence eastward to the Great Bight, *Maxwell*; and northward to Swan and Murchison Rivers, *Drummond*, *Preiss*, *n.* 1537, *Oldfield*.

4. **D. cærulea**, *Sims, Bot. Mag. t.* 505.—Leaves distichous and sheathing at the base, not so closely crowded on the stock as in the preceding species but more or less extending over the lower part of the stem, which is often branched at the base; the sheaths much flattened laterally, prominently and acutely keeled, and usually but not always scabrous on the edges; the lamina long, erect, and narrow, rarely attaining ½ in. in breadth and sometimes under 2 lines. Panicle usually loose as in *D. lævis*, but often smaller and the cymes sometimes dense and almost sessile along the main rhachis. Perianth-segments 3 to 4 lines long, with 5 or 3 nerves less crowded in the centre than in *D. lævis*, and the flowers usually blue. Filaments shorter than the anthers, with the thickened apex not longer than the filiform base and sometimes very short. Berry small and globular.—R. Br. Prod. 279; Baker in Journ. Linn. Soc. xiv. 576; F. Muell. Fragm. vi. 123; Red. Lil. ii. t. 79; *D. revoluta*, Bot. Reg. t. 1120.

N. Australia. Port Darwin, *Schultz, n.* 163 and 354; the specimens appear to be referrible rather to a broad-leaved form of *D. cærulea* than to *D. ensifolia*.

Queensland. Moist shady valleys and marshy places, from Moreton Bay, *A. Cunningham* and others, to Rockingham Bay, *Dallachy*; Palm Island, *Henne*; Cape York, *M'Gillivray, Hann's Expedition.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Sieber, n.* 199, and many others; northward to New England, *C. Stuart*; Hastings, Clarence, and Richmond rivers, *Beckler* and others; Lord Howe's Island, *C. Moore*.

This appears to be the commonest species from Port Jackson northwards, but I have seen no southern specimens.

D. graminifolia, Kunth Enum. v. 46, and *D. elegans*, Kunth l.c. v. 49, dubiously referred by Baker to *D. cærulea*, may belong to that species, but are not determinable from the wordy descriptions of single garden specimens, without any differential characters, and omitting some of the most essential ones.

D. congesta, R. Br. Prod. 280, Baker in Journ. Linn. Soc. xiv. 576, from Prince of Wales Islands, Torres straits, appears to me to be a form of *D. cærulea*, with dense sessile cymes; the inflorescence, however, in the specimen preserved is scarcely fully developed and almost destroyed by insects.

5. **D. ensifolia**, *Red Lil. t.* 1.—Very near the broad-leaved forms of *D. cærulea*, with the stems similarly leafy in the lower part and the sheaths acutely keeled, but the blades usually much broader, varying from ½ to 1 in. in breadth and the sheaths shorter and looser. Panicle of *D. cærulea*. Perianth-segments fully 4 lines long. Filaments shorter than the anthers, the thickened part very short and as broad as the anthers themselves. Fruit nearly globular, larger than in *D. cærulea*, but not so large as in *D. tasmanica*.—Baker in Journ. Linn. Soc. xiv. 576; Bot. Mag. t. 1404; *D. nemorosa*, Jacq. Hort. Schœnbr. t. 94.

Queensland. This, the common species in tropical Asia and in the Mascarene and Pacific Islands, appears to be represented in Australia by specimens from Rockingham Bay, *Dallachy*, precisely similar to some from China and the Philippine Islands; those from Arnhem's Land, referred to this species by Baker, appear to me to be nearer *D. cærulea*, but the distinction between these two very variable species is as yet very uncertain.

7. ASPARAGUS, Linn.

(Asparagopsis, *Kunth.*)

Flowers hermaphrodite polygamous or unisexual. Perianth deciduous, of 6 distinct nearly equal spreading 1-nerved segments. Stamens 6, attached to the base of the segments; filaments filiform or flattened; anthers versatile, usually short, the cells opening in longitudinal slits. Ovary sessile, short, 3-celled, with 2 or very few ovules in each cell; style simple, with a short 3-lobed stigma. Fruit a globular indehiscent berry. Seed usually reduced to a single one, with a black shining testa; albumen hard; embryo transverse.—Stems herbaceous, from a creeping rhizome, or shrubby much-branched and spreading or climbing to a considerable height, often armed with prickles under the branches. Cladodes (formerly called leaves, but now theoretically believed to be abortive branches) usually clustered, subulate, angular or laterally flattened, surrounded by small scarious scales representing the real leaves. Flowers small, solitary or 2 together in the axils of the scale-like real leaves, or by the reduction of flowering branches without cladodes forming short axillary racemes.

A very large genus, widely spread over the warmer and temperate regions of the Old World. The only Australian species extends also over tropical and subtropical Asia and Africa.

1. **A. racemosus,** *Willd.; Baker in Journ. Linn. Soc.* xiv. 623.—A slender but rigid much-branched straggling shrub, often climbing to a considerable height, armed with recurved prickles under the branches. Cladodes usually in clusters of 3 to 6, but sometimes solitary, very slender, slightly curved or rarely quite straight, flat or 3-angled, but always very narrow or subulate, very acute, mostly ¼ to nearly 1½ in. long. Flowers mostly hermaphrodite, in racemes of 1 to 2 in., the pedicels scattered singly or 2 together along the rhachis, and usually about 2 lines long. Perianth-segments nearly 1½ lines long. Stamens nearly as long as the perianth, the filaments slightly flattened; anthers small. Style short, with a spreading 3-lobed stigma. Berries small.—*A. fasciculatus,* R. Br. Prod. 281; F. Muell. Fragm. vii. 73; *Asparagopsis floribunda, A. Brownei,* and *A. Decaisnei,* Kunth, Enum. v. 98, 103, and numerous other synonyms quoted by Baker.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* mouth of Victoria River, *F. Mueller;* Goulburn Islands, *A. Cunningham;* King's Sound and Collier Bay, *Chapman;* Glenelg District, *Martin;* Liverpool River, *Gulliver;* Port Essington, *Armstrong;* Port Darwin, *Schultz, n.* 169.

Queensland. Cape York, *Daemel;* Cape Sidmouth, *C. Moore.*

Mr. Baker was of opinion that Brown's specimen might be referrible to an allied Asiatic species, *A. acerosus,* Roxb., but it appears to me to be precisely similar to some of Schultz's; and although it has the cladodes slightly firmer and more straight than usual in *A. racemosus,* yet not nearly so much so as in the true *A. acerosus.*

8. EUSTREPHUS, R. Br.

Perianth deciduous, of 6 distinct oblong segments, nearly equal in length, the 3 outer rather firmer, valvate in the bud, and shortly hood-

shaped at the apex; the 3 inner flat, obtuse, with thin more or less fringed margins. Stamens 6, hypogynous, not exceeding the perianth; filaments flat, erect, and often cohering in a tube; anthers oblong, erect, the cells opening in longitudinal slits. Ovary sessile, short, 3-celled, with several ovules in each cell; style filiform, with a terminal undivided stigma. Fruit nearly globular, 3-celled, with little or no pulp, the pericarp succulent, but at length dry, and often opening loculicidally in 3 valves. Seeds irregularly shaped, with a black thickly membranous testa, hard albumen, and small embryo.—A glabrous, much-branched leafy climber. Flowers small, few together, pedicellate in the upper axils.

The genus is limited to a single species exclusively Australian.

1. **E. latifolius.** *R. Br. Prod.* 281.—Stems much branched, often climbing to a great height, weak and flexuose, but not twining. Leaves sessile or nearly so, varying from broadly ovate-lanceolate to narrow-linear, usually tapering to a point, of a firm texture, with numerous fine but prominent nerves, mostly 2 to 4 in. long, those under the branches often reduced to small scales. Pedicels 2 to 6 together in the upper cells, filiform but rigid, 4 to 9 lines long, articulate close under the flower and persistent. Perianth-segments usually about 3 lines long. Stamens varying much in the respective proportions of the filaments and anthers, but both together usually almost as long as the perianth. Fruit usually above ½ in. diameter, of an orange colour, with about 8 to 12 seeds, but sometimes much smaller with very few seeds.—Baker in Journ. Linn. Soc. xiv. 572; Bot. Mag. t. 1245; Endl. Iconogr. t. 4; *E. Watsonianus*, Miq. in Linnæa., xviii. 84; *E. Brownei*, F. Muell. Fragm. vii. 78; *Luzuriaga latifolia*, Poir. Dict. Suppl. iii. 535.

Queensland. Rockingham Bay, *Dallachy.*
N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and many others; northward to Macleay River, *Beckler*; southward to Illawarra, *Shepherd*, *Ralston*; Twofold Bay, *F. Mueller.*
Victoria. Snowy River, *F. Mueller.*

Var. *angustifolia.* Leaves mostly linear or narrow-lanceolate, but occasionally with a few broad ones.—*E. angustifolius*, R. Br. l. c.; *Luzuriaga angustifolia*, Poir. l. c. 536.

Queensland. Much more common in tropical and subtropical latitudes than the broad-leaved form. Shoalwater Bay to Northumberland Islands, *R. Brown*; from Moreton Bay, *A. Cunningham* and others, to Rockhampton, Port Denison, Rockingham Bay, &c., *Bowman*, *Fitzalan*, *Dallachy*, and many others.
N. S. Wales. Port Jackson, *U. S. Exploring Expedition*; Richmond River, *Fawcett*, but the leaves all narrow in few specimens only.

9. GEITONOPLESIUM, A. Cunn.

Perianth deciduous, of 6 distinct oblong segments, equal in length, the 3 outer rather firmer, valvate in the bud and shortly hood-shaped at the apex; the 3 inner flat, obtuse, with thin entire margins, slightly imbricate. Stamens 6, hypogynous, not exceeding the perianth; fila-

ments filiform, free or very slightly connected in a ring at the base; anthers oblong-linear, erect, the cells opening in longitudinal slits. Ovary sessile, short, 3-celled, with several ovules in each cell; style filiform, the stigmatic apex undivided. Fruit nearly globular, 3-celled, without pulp, the pericarp somewhat succulent, at length dry and often opening loculicidally in 3 valves. Seeds irregularly shaped, with a black, rather thickly membranous testa, hard albumen and small embryo.—A glabrous, much-branched leafy climber. Flowers small, in loose terminal cymes.

The genus is limited to the single Australian species which extends to the South Pacific Islands. It closely resembles *Eustrephus* both in habit and character, differing only in inflorescence and in the entire not-fringed inner perianth-segments.

1. **G. cymosum,** *A. Cunn. in Bot. Mag. t.* 3131.—Stems much branched, twining and climbing to a considerable height, with small broad scales under each branch. Leaves from linear to lanceolate-oblong or almost ovate, contracted into a short petiole, obtuse acute or tapering into a fine point, usually 2 to 3 in. long, rather rigid, with fine nerves, the midrib more prominent. Flowers drooping, in loose terminal cymes, sometimes short simple and few-flowered, sometimes several in an oblong panicle of 3 to 4 in. Perianth purplish-green, 3 to 4 lines long, the pedicels usually shorter, articulate close under the flower, with a minute bract. Berry-like fruit of a dark blue, 4 to 6 lines diameter. Seeds few.—Baker in Journ. Linn. Soc. xiv. 572; F. Muell. Fragm. vii. 74; *Luzuriaga cymosa* and *L. montana*, R. Br. Prod. 282; *Medeola angustifolia*, Red. Lil. t. 393; *Geitonoplesium montanum* and *G. asperum*, A. Cunn. l. c.; *G. angustifolium*, C. Koch in Walp. Ann. vi. 143.

Queensland. From Moreton Bay, *A. Cunningham, Leichhardt*, to Rockhampton, Rockingham Bay, and Percy Islands, *Dallachy*, *A. Cunningham*, and others.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and others; northward to New England, *C. Stuart;* Richmond, Clarence and Hastings Rivers, *Beckler*, *Henderson*, *C. Moore*, and others; southward to Kiama, *Harvey*; Illawarra, *A. Cunningham*, *Shepherd*; and Twofold Bay, *F. Mueller*.

Victoria. Lake King and other localities in eastern Gipps' Land, *F. Mueller* and others.

TRIBE 6. DRACÆNEÆ. Perianth more or less gamophyllous, deciduous. Anthers versatile. Style undivided. Berry indehiscent, or at length dry and 3-valved. Stems woody, sometimes arborescent. Flowers paniculate.

10. DRACÆNA, Linn.

Perianth deciduous, tubular, straight, with 6 equal narrow lobes, as long as or shorter than the tube. Stamens 6, inserted at the orifice of the tube, and not exceeding the lobes; filaments filiform or flattened; anthers oblong, versatile, the cells opening in longitudinal slits. Ovary sessile, short, 3-celled, with 1 erect ovule in each cell; style filiform,

with a capitate obscurely 3-lobed stigma. Fruit a succulent indehiscent berry, with 3 cells and seeds, or frequently 1 or 2 only by abortion. Seeds thick and large, with a thin smooth testa closely adhering to the hard albumen; embryo usually small.—Shrubs or trees, the trunk and branches marked by the annular scars of fallen leaves. Leaves at the ends of the branches long and narrow, sessile or contracted into a petiole, dilated and stem-clasping but scarcely sheathing at the base. Flowers in panicles or heads, articulate on the top of the pedicels. Bracts usually small, scarious, with a pair of smaller bracteoles when the flower is solitary within the bract, several when the flowers are clustered.

A considerable genus, inhabiting the warmer regions of the Old World and including the celebrated Dragon trees of Teneriffe. The only species found in Australia is shrubby and widely spread over the Indo-Australian region.

1. **D. angustifolia,** *Roxb.; Baker in Journ. Linn. Soc.* xiv. 526.—Stems not much branched and slender but woody, attaining 6 to 12 ft. in height. Leaves rather crowded under the terminal panicle, 8 in. to nearly 1 ft. long, ½ to 1 in. broad, ending in a fine point, shortly contracted at the base but not distinctly petiolate nor sheathing. Panicle ½ to 1 ft. long, with few branches, the pedicels 2 to 3 lines long, very slender, usually clustered 2 or 3 together along the branches. Bracts and bracteoles small. Perianth narrow, white or greenish, about ¾ in. long, the lobes linear, rather longer than the tube. Stamens attached about the middle of the tube, the anthers much shorter than the filiform filaments. Fruit ⅓ in. diameter or rather more, pulpy inside, with 1, 2 or 3 large seeds.—*Cordyline Rumphii*, F. Muell. Fragm. v. 194, but not the plant figured under that name in Bot. Mag. t. 4279; *Dracæna reflexa*, F. Muell. Fragm. vi. 120, but not the Mauritius plant to which Lamarck gave that name.

N. Australia. Port Essington, *Armstrong*; Port Darwin, *Schultz, n.* 857; Castlereagh River, *Gulliver.*

Queensland. Port Macquarrie and all along the east coast northwards, *A. Cunningham*; Barnard and Fitzroy Islands, *M'Gillivray*; Cape York, *Daemel.*

11. **CORDYLINE,** Comm.

Perianth deciduous, tubular, straight, with 6 narrow lobes, usually longer than the tube, all equal or the 3 outer ones rather shorter. Stamens 6, inserted at the base of the lobes and shorter than them or scarcely longer; filaments filiform or flattened; anthers narrow-oblong, the cells opening in longitudinal slits. Ovary sessile, short, 3-celled, with several (4 to 16) ovules in each cell, superposed in 2 rows; style filiform, with a capitate or shortly 3-lobed stigma. Fruit nearly globular, 3-celled, without pulp, but the pericarp more or less succulent, often becoming quite dry when fully ripe, indehiscent or more or less opening loculicidally in 3 valves. Seeds several in each cell, or solitary by abortion, variously shaped but usually curved, the testa crustaceous, black and shining; albumen waxy; embryo curved and sometimes nearly as long as the albumen.—Shrubs or trees, the branches marked by the annular scars of the fallen leaves. Leaves crowded under the panicle or more or less spread along the branches, long and narrow or short and broad, petiolate or nearly sessile, with short imbricate sheaths. Panicles terminal or sometimes axillary, the flowers usually smaller than in *Dracæna*, solitary or clustered along the branches, sessile or pedicellate, each within a small bract with 2 small bracteoles at their base.

The genus is widely spread over the warmer regions of the Old World, with one American species. Of the three Australian species, one is common over a great part of the Indo-Australian region, the two others are endemic.

Perianth-segments of equal length.
  Leaves 1 to 1½ ft. long, 1 to 3 in. broad, with a short petiole . . . . 1. *C. terminalis.*
  Leaves 3 to 6 in. long, 1½ to 2½ in. broad, with a rather long petiole . . . . 2. *C. Haageana.*
Inner perianth-segments longer than the outer. Leaves 1 to 2 ft. long, ½ to 1 in. broad or even narrower . . . 3. *C. stricta.*

1. **C. terminalis,** *Kunth; Baker in Journ. Linn. Soc.* xiv. 539.—Stems attaining 3 to 6 ft. Leaves crowded under the panicle, from 1 to 1½ ft. long or the upper ones half that length, varying from 1 to 3 in. broad, acuminate at the end and tapering at the base into a sheathing petiole. Panicle often 1 ft. long, with spreading solitary or clustered branches of 3 to 8 in. Flowers scattered along the branches either singly or in clusters of 2 or 3, varying from almost sessile to borne on pedicels attaining sometimes 4 or 5 lines. Perianth usually about 4 lines but sometimes attaining 5 lines in length, white reddish or almost purple, divided to about the middle into 6 equal segments. Stamens attached near the base of the segment; anthers not much shorter than the filaments and not exceeding the perianth. Ovules 4 to 10 in each cell of the ovary. Fruit nearly globular, 3 to 4 lines diameter in the dried specimens, more or less succulent before it is ripe, but usually becoming dry or nearly so when the seeds are fully ripe.—*Dracæna terminalis*, Jacq. Ic. Rar. t. 448; Red. Lil. t. 91; Bot. Reg. t. 1749; Lodd. Bot. Cab. t. 1224; *D. ferrea*, Linn.; Bot. Mag. t. 2053; *Cordyline cannæfolia*, R. Br. Prod. 280; F. Muell. Fragm. v. 196.; *C. sepiaria*, Seem. Fl. Vit. 311, t. 94.

Queensland. Shoalwater Bay, *R. Brown*; Ipswich, *Nernst*; Pine River, *Fitzalan*; Rockingham Bay, *Dallachy*.

N. S. Wales. Clarence River, *Beckler*; Richmond River, *Henderson*, *Fawcett*.

The species is generally spread over tropical Asia and Polynesia. In the ordinary Australian form, which is also the common one elsewhere, the pedicels are rarely above 1 line long, and frequently the flowers are all but sessile, the leaves are usually from 6 to 10 times as long as broad. From this the var. *hedychioides* or *C. hedychioides*, F. Muell. Fragm. v. 196, from Cape York, appears to me only to differ in the leaves broader in proportion to their length. The fruit in our specimens may be a trifle larger, but if taken at the same degree of maturity does not appear to be drier than in the common form.

Var. *Manners-Suttoniæ* or *C. Manners-Suttoniæ*, F. Muell. Fragm. v. 195, from Mount Elliott, *Fitzalan*, and Rockhampton, *Dallachy*, *Bowman*, is remarkable for the rather large white flowers on pedicels in the typical specimens 4 to 5 lines long, but, as shown by Baker, it is closely connected with the common form by several extra-Australian varieties, amongst others by that gathered by Sieber in the Mauritius.

2. **C. Haageana,** *C. Koch, Wochenschr. für Gærtn.* 1867, 195.—A small leafy species, the stems often not above 2 ft. high. Leaves much shorter than in the other species, usually 3 to 6 in. long and 1½ to 2½ in. broad, abruptly contracted into a rather long petiole, and covering nearly the whole of the flowering branch. Panicles sometimes not longer than the leaves, sometimes twice as long, with few branches. Flowers the same as in *C. terminalis.* Fruit also similar but smaller.—Baker in Journ. Linn. Soc. xiv. 541; *C. Murchisoniæ,* F. Muell. Fragm. v. 195.

Queensland. *A. Cunningham*; Rockhampton, *O'Shanesy*; Rockingham Bay and Mount Elliott, *Dallachy*; Port Denison, *Fitzalan.*

3. **C. stricta,** *Endl. in Ann. Wien. Mus.* i. 162.—Habit and stature of *C. terminalis,* but the leaves very much narrower, rarely 1 in. and often not above ½ in. broad when 1 to 2 ft. long. Perianth and inflorescence of *C. terminalis,* except that the three outer segments of the perianth are distinctly shorter than the inner ones when the flower is fully out, and sometimes not above ¾ of their length. The pedicels are also usually very short or the flowers quite sessile.—F. Muell. Fragm. v. 195; Baker in Journ. Linn. Soc. xiv. 544; *Dracæna stricta,* Sims, Bot. Mag. t. 2575; Bot. Reg. t. 956: *Charlwoodia congesta,* Sweet, Fl. Austral. t. 13; *Cordyline angustifolia* and *C. congesta,* Kunth, Enum. v. 32; *C. rigidifolia,* C. Koch and Bouché in Berl. Gartenzeit. quoted by Baker.

Queensland. Moreton Bay, *Fraser.*

N. S. Wales. Port Macquarrie, *Tozer*; Hastings River, *Beckler*; Richmond River, *Henderson* and others; Clarence River, *Wilcox.*

SERIES 2. CAPSULARES. Fruit dry, capsular or rarely of 1 to 3 indehiscent 1-seeded nutlets.

TRIBE 7. HEMEROCALLIDEÆ. Perianth gamophyllous, tubular or campanulate. Style undivided. Stock not bulbous.

12. BLANDFORDIA, Sm.

Perianth persistent, tubular but much widened upwards and sometimes almost campanulate, with 6 equal short and broad lobes. Stamens 6, attached at or rather above the middle of the corolla-tube and shorter or scarcely longer than its lobes; filaments filiform; anthers oblong, versatile, the cells opening in longitudinal slits. Ovary contracted into a long stipes, 3-celled, with numerous ovules in a double row in each cell, tapering into a short style, with a terminal 3-grooved stigma. Capsule on a long stipes, long and narrow, prominently 3-angled, opening septicidally in 3 valves. Seeds numerous, horizontal, oblong, the testa rather thick and densely covered with very prominent almost hair-like papillæ; albumen copious.—Herbs with thickly fibrous roots and tall rigid scapes or stems. Leaves crowded at the base of the stem, with distichously imbricated sheaths, the lamina long and narrow with prominent nerves; a few upper leaves distant, short and erect. Flowers large, pendulous, in a short simple terminal raceme, each one in the axil of a narrow bract, with two smaller very narrow bracteoles at the base of the pedicel. Capsule erect, more or less surrounded by the withered perianth.

The genus is limited to Australia.

Flowers rather numerous and crowded, the pedicels when in flower rarely exceeding the bracts.
  Perianth (about 1½ in.) narrow and gradually tapering to the base. Lobes about ¼ in. Stamens attached far above the middle . . . . 1. *B. marginata.*
  Perianth (about 2 in.) narrow in the lower part, very broad upwards. Lobes about ½ in. Stamens attached below the middle . . . . 2. *B. grandiflora.*
Flowers few, in a loose raceme, the pedicels much longer than the bracts.
  Perianth (1 to 1¼ in.) narrow in the lower part, abruptly dilated at about the middle, not broader at the throat . 3. *B. nobilis.*
  Perianth (1½ in. or more) broad almost from the base and much dilated upwards, almost campanulate . . . . 4. *B. flammea.*

1. **B. marginata,** *Herb. in Bot. Reg.* 1842, *Misc.* 84, 1845, t. 18.—Stems rather stout, attaining 2 to 3 ft. Lower or radical leaves often above 1 ft. long and 3 or 4 lines broad, the upper ones few, short and erect. Racemes usually short and crowded, but sometimes lengthening to 6 or 8 inches. Flowers numerous, of a rich brown red, the pedicels at first very short, but lengthening to 1 or even to 2 inches. Bracts narrow, often longer than the flowering pedicel but shorter than the fruiting one. Perianth 1¼ to 1½ in. long, narrower and more gradually tapering to the base than in the other species, the lobes broad, about 3 lines long. Filaments adnate to far above the middle of the corolla tube. Capsule 1 to 1½ in. long, tapering into a stipes often 1 in. long.—F. Muell. Fragm. vii. 71; *Aletris punicea*, Labill. Pl. Nov. Holl. i. 85, t. 111; *B. grandiflora*, Hook. f. Fl. Tasm. ii. 49; Baker in Journ. Linn. Soc. xi. 365, not of R. Br.; *B. Backhousii*, Lindl. Bot. Reg. 1845 under t. 18; *B. intermedia*, Herb. in Bot. Reg. 1845, Misc. 64.

Tasmania. Not uncommon in various parts of the island, ascending to 4000 ft. *J. D. Hooker* and many others.

2. **B. grandiflora,** *R. Br. Prod.* 296.—A tall handsome species, with the many-flowered crowded racemes of *B. marginata*, and the bracts often nearly as long though broader. Lower leaves long as in that species but narrower, the short upper sheathing leaves ending in erect almost subulate points. Perianth fully 2 in. long, red at the base but the yellow apex usually extending to ⅓ of its length, the lower part narrow to nearly ½ its length, then much expanded, the lobes broadly ovate and fully ½ in. long. Stamens attached below the middle of the perianth.—Paxt. Mag. vii. 219 with a plate; *B. Cunninghamii*, Lindl. Bot. Reg. 1845 under t. 18; Bot. Mag. t. 5734; Baker in Journ. Linn. Soc. xi. 365.

N. S. Wales. Elevated peaty bogs in the Blue Mountains, *A. Cunningham*, *C. Moore*; Hunter's River, *R. Brown*.

Var. *elongata*. Stems tall, the lower leaves probably very long but wanting in our specimens, upper sheaths ending in subulate points of 6 to 8 in. Peduncles much exceeding the bracts. Perianth 2 to 2½ in. long, with the long narrow base, broad apex, and deep lobes of the typical form. Anthers rather long and almost exceeding the corolla.
Blue Mountains, *C. Moore*.

3. **B. nobilis,** *Sm. Exot. Bot.* i. 5, t. 4. Stems attaining sometimes 2 or 3 ft. but not so stout as in the preceding species. Leaves long and narrow, in the wild specimens not much above 2 lines broad, but often broader when cultivated. Flowers often only 4 or 5 in the raceme, although occasionally twice as many, the pedicels 2 or 3 times as long as the bracts even at the time of flowering. Perianth 1 to 1½ in. long, of a brownish-red, the upper part yellow, and at first with a green tip, narrow at the base, somewhat abruptly dilated at about the middle, but scarcely broader or sometimes slightly contracted at the throat, the lobes shorter than broad and usually very obtuse. Stamens adnate to about the middle of the perianth or sometimes free rather lower down. —R. Br. Prod. 296; Baker in Journ. Linn. Soc. xi. 365; F. Muell. Fragm. vii. 70; Bot. Reg. t. 286; Bot. Mag. t. 2003; Endl. Iconogr. t. 27.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, *n.* 195 and many others.

B. grandiflora, Bot. Reg. t. 924, but not of R. Br., appears to me to be a variety of *B. nobilis*, with the flowers rather broader than usual, but neither tapering to the base as in *B. marginata*, nor with the very wide throat of *B. grandiflora* and *B. flammea*. The scabrous or minutely serrated margins of the leaves by which some of the species of *Blandfordia* have been distinguished are not constant in any one of them.

4. **B. flammea,** *Hook. Bot. Mag. t.* 4819.—A tall species, with the narrow foliage and usually few flowers and short bracts of *B. nobilis*, but the flowers much larger and differently shaped. Perianth usually above 1½ in. long, much dilated almost from the base and very broad upwards, so as to be almost campanulate, the lobes short broad and obtuse, the colour usually a rich brown-red in the lower part, the broad upper portion from yellow to orange, but sometimes yellow or orange almost or quite from the base.—Baker in Journ. Linn. Soc. xi. 366; Lindl. in Paxt. Mag. Bot. xvi. 353, with a plate; Fl. des Serres, t. 585; *B. Cunninghamii*, Fl. des Serres, t. 1829, but not of Lindl.

N. S. Wales. Port Macquarrie, *Backhouse*; Tweed River, *C. Moore*; Hastings River, *Beckler*; Richmond River, *Henderson*, *Mrs. Hodgkinson*; New England, *C. Stuart*.

B. aurea, Hook. Bot. Mag. t. 5809, Baker in Journ. Linn. Soc. xi. 366, appears to me to be a variety of *B. flammea*, with the perianth yellow from the base. Of the var. *princeps* figured Bot. Mag. t. 6209, we have no specimen; the perianth is represented as large as that of *B. grandiflora*, but shaped as in *B. flammea*, of which it has also the loose raceme and short bracts.

Tribe 8. Melanthaceæ. Perianth-segments free or shortly united at the base, rarely to the middle. Style more or less divided into 3 stigmatic branches or short distinct styles. Stock not at all or scarcely bulbous. Anthers frequently turned outwards.

13. HEWARDIA, Hook.

Perianth divided nearly to the base into 6 petal-like deciduous spreading segments, all nearly equal and similar, the very short persistent base adnate to the base of the ovary. Stamens 3, attached to the base of the inner segments and much shorter than them; filaments short, dilated below the middle; anthers erect, sagittate, the cells opening outwards in longitudinal slits. Ovary sessile, 3-celled, with numerous ovules superposed in 2 rows in each cell; style short, with 3 recurved stigmatic lobes. Capsule oblong, coriaceous, opening loculicidally in 3 valves, leaving a persistent central placentiferous columella. Seeds unknown. —Perennial with the equitant leaves distichous and crowded at the base of the stem as in *Irideæ*. Stem simple, with a single rather large terminal flower.

The genus is limited to the single Tasmanian species. It has all the characters of *Irideæ*, except that the ovary is superior, adnate only by the very short base, and it ought perhaps to be referred to that order as an exceptional genus.

1. **H. tasmanica**, *Hook. Ic. Pl. t.* 858.—Stock densely tufted. Leaves chiefly radical, the sheaths distichous, imbricated and acutely keeled, the blade vertically flattened, rigid, erect, acute, mostly about 3 in. long and 2 lines wide, but in some luxuriant specimens 8 or 9 in. long and 3 lines wide. Stem 6 in. to 1 ft. high, with 2 or 3 distant sheathing short leaves, more membranous than the radical ones, and the 2 uppermost usually close together, 1 to 1½ in. long, forming a double sheath enclosing the pedicel. Flower solitary, terminal, on a pedicel shorter than the perianth but often lengthening after flowering. Perianth purple, the segments lanceolate, acuminate, 1 to 1½ in. long. Stamens less than half as long. Style deciduous. Capsule only seen half-grown with a single old one about ½ in. long, open with the seeds all fallen away.—Hook. f. Fl. Tasm. ii. 47; F. Muell. Fragm. vii. 72.

Tasmania. Heathy plains and mountain ranges near Macquarrie Harbour, *Milligan, Gunn;* summit of Mount Lapeyrouse, *Oldfield, C. Stuart;* alpine regions of Mount Field East, *F. Mueller;* Arthur's Range and Lake Pedder, *Johnstone.*

14. MILLIGANIA, Hook. f.

Perianth persistent, divided nearly to the base into 6 membranous irregularly 3-nerved lobes, all equal and similar. Stamens 6, attached to the base of the lobes and shorter than them; filaments slightly flattened; anthers ovate, erect or scarcely versatile, the cells opening laterally in longitudinal slits. Ovary sessile, 3-celled, with rather numerous ovules in each cell superposed in 2 rows; style more or less deeply divided into 3 lobes stigmatic at the end. Capsule membranous with 3 laterally prominent lobes or angles, opening loculicidally at the apex in 3 valves. Seeds several, narrow, often somewhat curved, with a hooked terminal appendage; testa black, crustaceous, shining; albumen fleshy; embryo linear, central or nearly so.—Densely tufted rather tall or dwarf plants, the stem inflorescence and sometimes the leaves more or less clothed or sprinkled with loose almost woolly hairs. Leaves chiefly radical, long and very prominently nerved. Stems erect, shortly leafy at the base. Flowers numerous in a terminal panicle, shortly pedicellate along its branches, or rarely few in a short corymb each within a single bract, and usually hermaphrodite.

The genus is limited to Tasmania. With something of the habit of *Astelia*, the characters are more nearly those of *Anguillaria*.

Perianth enclosing the fruit. Stamens very short. Style very short, conical, deeply 3-lobed.
  Panicle dense. Flowers almost sessile . . . . 1. *M. densiflora.*
  Panicle loose. Flowers distinctly pedicellate . . . . . 2. *M. longifolia.*
Perianth enclosing the fruit. Style and stamens of *M. stylosa.* Dwarf plant, with a corymb of less than 6 flowers . . . . 3. *M. Johnstoni.*
Perianth reflexed under the small fruit. Stamens more than half as long as the perianth. Style filiform, longer than the ovary, shortly 3-lobed at the apex. Panicle many flowered . . . . 4. *M. stylosa.*

1. **M. densiflora,** *Hook. f. Fl. Tasm.* ii. 62.—Very near *M. longifolia*, but the leaves are shorter, broader, more rigid, the panicle narrow and compact, 6 to 8 in. long. Flower crowded on the short branches and very nearly sessile, the perianth larger than in *M. longifolia*, the lobes 5 or even 6 lines long. Stamens very short.

Tasmania. Mount Sorrel, Macquarrie Harbour, *Milligan;* Mount Lapeyrouse, *Oldfield.*

2. **M. longifolia,** *Hook. f. in Hook. Kew Journ.* v. 296, *t.* 9, *Fl. Tasm.* ii. 61.—Radical leaves 1 to 2 ft. long, with long broad sheathing bases, the blade often ½ in. broad, tapering at the end into a long point. Stems 1 to 2 ft. high, with 2 or 3 leaves in the lower part shorter than the radical ones, the greater part occupied by an ample panicle, the rhachis more or less woolly hairy. Bracts rather large and leafy under the principal branches, membranous and usually longer than the pedicel under each flower. Flowers pedicellate along the branches, forming loose racemes. Perianth about 3 to 3½ lines long, the lobes oblong, obtuse, about 3 times as long as the undivided base. Style short and thick, often persistent but splitting into 3 2-lobed styles terminating the 3 valves. Capsule about 2 lines long and not quite so broad. Seeds ascending or the lower ones pendulous, narrow-oblong, with a very prominent hooked point, the hilum end also shortly incurved.

Tasmania. Franklin River, *Gunn;* Macquarrie Harbour, *Milligan.*

3. **M. Johnstoni,** *F. Muell. Herb.*—A dwarf plant, the stems 1 to 3 in. long, covered with the broad leaf-sheaths, some of the older ones split into filaments. Blade of the leaves lanceolate, acute, not above

1 in. long. Flowers 3 to 6, in a little corymb about as long as the leaves, the pedicels short, each one in the axil of a leafy bract not longer than the perianth. Perianth about 4 lines long, divided to about the middle into narrow-oblong lobes, the tube broad, very shortly adnate at the base. Stamens shortly exserted from the tube; anthers ovate-oblong. Style slender, about as long as the ovary, very shortly 3-lobed at the apex. Capsule shorter than the tube, the angles scarcely prominent but opening readily in 3 slits, although not quite ripe in the specimens seen.

Tasmania. Alpine country on the Huon River, *R. Johnston.*

4. **M. stylosa,** *F. Muell. Herb.*—Radical leaves 6 in. to above 1 ft. long and ¾ to 1 in. broad in the broadest part, but rapidly tapering to a long point. Stems stout, 1 to 1½ ft. high, the loose wool of the inflorescence much shorter than in *M. longifolia.* Panicle rather dense, with numerous flowers, and a few broad leafy bracts of 1 in. or more under the principal branches, the bracts under the pedicels rarely exceeding the perianths. Flowers racemose along the branches, on pedicels of 2 to 4 lines long. Perianth-segments narrow, about 2 lines long, reflexed under the fruit. Stamens rather shorter than the perianth, with small ovate anthers. Ovary depressed-globular, the ovules rather numerous; style subulate, at least as long as the ovary, shortly but distinctly 3-lobed at the apex. Capsule not 2 lines diameter, with 3 obtuse prominent angles, the pericarp rather thick but opening readily at the angles although not quite ripe in our specimens. Seeds few, black, angular, but variously shaped.—*Astelia stylosa,* F. Muell. in Hook. f. Fl. Tasm. ii. 61.

Tasmania. Summit of Mount Lapeyrouse, where it forms dense masses, *Oldfield, C. Stuart.* The hermaphrodite flowers and capsular fruit place this plant undoubtedly in *Milligania* and not in *Astelia.*

15. WURMBEA, Thunb.

Perianth persistent, divided to the middle or more deeply into 6, rarely 8, spreading lobes or segments all equal and similar. Stamens 6, rarely 8, attached to the base of the lobes or segments and shorter than them; filaments filiform, usually dilated at the base; anthers ovate, erect or almost versatile, the cells opening laterally or almost outwards in longitudinal slits. Ovary sessile, 3-celled, with several ovules in each cell; styles 3, filiform, recurved, stigmatic along the inner edge from the base or towards the end. Capsule prominently 3-angled, truncate at the top, opening loculicidally in 3 valves. Seeds globular, the testa thin brown and appressed, albumen fleshy, rather hard. Embryo small, near the hilum.—Small herbs, the base of the stem and persistent brown leaf-sheaths thickened into a narrow tunicated bulb. Leaves few, ovate lanceolate or linear. Flowers either solitary and terminal or in a terminal spike, sessile along the rhachis, hermaphrodite or sometimes polygamous. Bracts none.

Besides the four Australian species which are endemic in the south-western districts, there are several from South Africa.

Leaves ovate or lanceolate. Spikes dense. Perianth 6-lobed.
  Perianth-segments united to the middle, 7 to 9 lines long 1. *W. tubulosa.*
  Perianth-segments united to ¼, 3 to 4 lines long . . . 2. *W. Drummondii.*
Leaves linear or linear-lanceolate. Spikes few-flowered.
  Perianth-segments 6, united to ⅓. . . . . 3. *W. pygmæa.*
Leaves almost filiform. Flowers solitary. Perianth-segments 8, very shortly united . . . . 4. *W. tenella.*

1. **W. tubulosa,** *Benth.*—Bulb and lower leaves unknown; upper leaf broadly lanceolate, contracted at the base and tapering into a long point. Spike dense, of above 10 flowers. Perianth 7 to 9 lines long, the segments united to near the middle into a narrow tube; lobes acute, without transverse glands. Stamens attached to the base of the lobes, much shorter than them, with small anthers. Ovary in the flower examined narrow, probably imperfect, with 3 long filiform styles.

W. Australia. Champion Bay, *Herb. F. Mueller*, where there are only two spikes, but the peculiar flowers do not admit of referring them to any other species; the perianth-tube is indeed longer than in any African one except *W. longiflora.*

2. **W. Drummondii,** *Benth.*—A dwarf plant, none of our specimens exceeding 4 in. Bulb tunicated, shining. Leaves 2 or 3, ovate or lanceolate, acute but not acuminate, 1 to 1¼ in. long in our specimens and 3 to 6 lines broad at the base. Flowers in a rather dense spike, polygamous and usually small, but the perianth varying from under 3 to above 4 lines in length, the segments united to about ¼ of their length. Stamens attached to the base of the lobes and shorter than them; anthers small, shortly ovate. Styles scarcely longer than the ovary.

W. Australia. Swan River, *Drummond, 1st coll.*

3. **W. pygmæa,** *Benth.*—Nearly allied to *W. Drummondii* and stature as small, but the leaves much narrower, linear or linear-lanceolate, contracted at the base, flowers smaller, fewer in the spike, often only 1 or 2, perianth-segments 6 (or very rarely a 7th) scarcely united to above ⅓ of their length, of a rather thick consistence, and glandular-dotted outside.—*Anguillaria pygmæa*, Endl. in Pl. Preiss. ii. 45.

W. Australia. Swan River, *Drummond, 1st coll., Preiss, n.* 1599.

4. **W. tenella,** *Benth.*—A small slender plant, resembling at first sight the slender 1-flowered specimens of *Anguillaria dioica*, the stem almost filiform, with usually 1 long filiform leaf and 1 or 2 shorter ones scarcely dilated at the base. Flowers solitary and terminal in all the specimens seen. Perianth-segments almost always 8, very spreading, narrow, about 8 lines long, with an orbicular gland about the middle, all shortly united at the base. Stamens shorter than the perianth, the filaments much dilated and united in a ring at the base; anthers small.

Styles scarcely longer than the ovary.—*Anguillaria tenella*, Endl. in Pl. Preiss. ii. 45.

W. Australia. Swan River, *Drummond, 1st coll.*, *Preiss, n.* 1698; Greenough Flats, *C. Gray.*

16. ANGUILLARIA, Br.

Perianth persistent, of 6 distinct spreading segments, all equal and similar. Stamens 6, attached to the base of the segments or almost hypogynous, shorter than the perianth; filaments filiform, dilated towards the base; anthers ovate-oblong, versatile, the cells opening laterally in longitudinal slits. Ovary sessile, 3-celled, with rather numerous ovules in each cell; styles 3, distinct or united at the base, shortly filiform, recurved, stigmatic along the inner edge at least towards the end. Capsule prominently 3-angled, opening loculicidally in 3 valves. Seeds small, globular, the testa thin brown and appressed; albumen fleshy, rather hard. Embryo small, near the hilum.—Small herbs, the base of the stem and persistent brown leaf-sheaths thickened into a narrow tunicated bulb. Leaves few, linear, the uppermost reduced to a broad loose sheath and short lamina or point. Flowers often more or less diœcious, either solitary and terminal or sessile along the rhachis of a simple spike. Bracts none.

The genus is limited to the two species endemic in Australia. It only differs from *Wurmbea* in the perianth-segments distinct from the base.

Perianth-segments without any transverse gland. Styles shortly united at the base . . . . 1. *A. densiflora.*
Perianth-segments with a transverse single or double gland below the middle. Styles distinct from the base . . . 2. *A. dioica.*

1. **A. densiflora,** *Benth.*—Bulb copiously tunicated. Stems about 6 in. high and leaves as in *A. dioica*, but the upper one less dilated at the base. Flowers 3 to 6, in a close terminal flexuose spike, hermaphrodite in the specimens seen. Perianth-segments 4 to 5 lines long, less spreading from the base than in *A. dioica*, scarcely imbricate, without any transverse gland. Stamens nearly as long as the perianth, the filaments slightly dilated at the base, anthers narrow-oblong. Styles filiform, considerably longer than the ovary, very shortly united at the base.

W. Australia. Murchison River, *Oldfield;* Greenough Flats, *C. Gray.*

2. **A. dioica,** *R. Br. Prod.* 273.—Bulb tunicated. Stem varying from 2 or 3 in. to nearly 1 ft. high. Leaves few, the lowest reduced to brown elongated sheaths, perfect ones usually 3 or 4, linear, varying from 1 to 3 or even 4 in. long, the lowest sometimes narrow from the base, the others more or less dilated at the base into a broad loose sheath, the uppermost often reduced to the broad base with a short point or only acute, and therefore sometimes called a spatha. Flowers either solitary and terminal or 1, 2 or more sessile along the simple rhachis which is often flexuose, polygamous, the strictly female ones

without staminodia generally on a separate plant, the males and hermaphrodites usually in one spike. Perianth-segments oblong or linear, 3 to 6 lines long, bearing below the middle on the upper surface a transverse gland sometimes broken up into 2. Styles shortly filiform, distinct from the base. Capsule ovate or oblong, truncate at the top, 4 to 5 lines long.—Endl. in Pl. Preiss. ii. 44; Hook. f. Fl. Tasm. ii. 46; Endl. Iconogr. t. 3; *A. biglandulosa* and *A. uniflora*, R. Br. Prod. 273; *A. monantha*, Endl. in Pl. Preiss. ii. 45; *A. australis*, F. Muell. Fragm. vii. 74; *Pleea Sieberi*, Reichb. in Sieb. Pl. Exs.; *Melanthium Brownii*, Schlecht. Linnæa, i. 86.

Queensland. Moreton Bay, *Leichhardt*; Warwick, *Beckler*; Darling Downs, *Woolls*; Armidale, *Perrott*; Rockhampton, *O'Shanesy*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, *n.* 156, and many others; northward to New England, *C. Stuart*; Clarence River, *Wilcox*; Richmond River, *Henderson*.

Victoria. Wendu Vale, *Robertson*; about Melbourne, *Adamson*, *F. Mueller*, and others.

Tasmania. Port Dalrymple, *R. Brown*; abundant throughout the island, *J. D. Hooker*.

S. Australia. St. Vincent's Gulf, *F. Mueller*; Mount Gambier, *Mrs. Wehl*; Yorke Peninsula, *Fowler*; in the interior from Lake Eyre to the River Finke, *Giles*.

W. Australia. From King George's Sound to Swan River, *Drummond*, 1*st coll.*, *n.* 784, 785, 786, *Preiss*, *n.* 1598, 1600, 1602, 1603, and many others; Murchison River, *Oldfield*.

An exceedingly variable species, of which I have found it impossible to distribute the numerous specimens before me, from very varied localities, into distinct races, either by general size or by that of the perianth, by the more or less spathiform upper leaves, by the number of flowers, 1, 2 or more in the spike, by the colour of the segments described as yellow, with or without a purple margin, or almost wholly purple, or by the union or distinctness of the glands on their surface.

17. IPHIGENIA, Kunth.

Perianth deciduous, of 6 distinct spreading segments, all equal and similar. Stamens 6, hypogynous, very much shorter than the perianth; anthers ovate-oblong, versatile, the cells opening laterally in longitudinal slits. Ovary sessile, 3-celled, with rather numerous ovules in each cell; styles 3, very shortly united at the base, recurved, stigmatic along the inner edge. Capsule less angular than in *Anguillaria*, opening loculicidally in 3 valves. Seeds small, globular, the testa thin brown and appressed; albumen fleshy. Embryo small, near the hilum.—Herbs forming a small tunicated bulb, the stem simple, with few narrow leaves. Flowers few, on long pedicels, or sessile in a species not Australian.

Besides the Australian species, which is widely distributed over East India, there are one or two others from East India, and one in New Zealand. The genus is closely allied to *Anguillaria*, and was included in it by R. Brown, differing from it chiefly in the separately deciduous perianth-segments and stamens. Kunth places it in a different Order, as having the anthers introrse, not extrorse. I have failed to detect this difference: in both cases the cells appear to me in the bud to be strictly lateral, placed back to back, the filament attached in the emarginate base of the anther, and when the flower is expanded the anther becomes versatile, with the attachment, if not basal, rather dorsal than towards the inner face.

1. **I. indica,** *Kunth, Enum.* iv. 213.—Stems simple, about 1 ft. high in the Australian specimens, slender, with a few rather long linear or linear-lanceolate leaves, sheathing at the base. Flowers few, at the end of the stem, on rather long slender pedicels, subtended, at least the lower ones, by leafy bracts. Perianth purple or red, the segments narrow-linear, about 3 lines long in the Australian specimens, longer in some Indian ones. Capsule ovoid or oblong, 4 to 5 lines long.—F. Muell. Fragm. vii. 74; *Anguillaria indica*, R. Br. Prod. 273; Wall. Pl. As. Rar. iii. t. 259.

N. Australia. Arnhem N. bay and islands of the coast, *R. Brown*; Sea Range, *F. Mueller*.

Queensland. Rockhampton and adjoining districts, *Bowman, O'Shanesy*; Rockingham Bay, *Dallachy*.

18. SCHELHAMMERA, Br.

Perianth of 6 distinct deciduous segments, all nearly equal and similar, induplicate or convolute round the corresponding stamens in the bud, spreading and flat when in flower. Stamens 6, attached to the base of the segments and shorter than them; filaments thick or flattened, tapering under the anther; anthers oblong, erect, the cells opening laterally in longitudinal slits, turned outwards when fully out. Ovary sessile, prominently 3-angled, 3-celled, with several ovules superposed in 2 rows in each cell; style more or less deeply divided into 3 recurved lobes stigmatic along the inner edge. Capsule nearly globular, with an almost fleshy pericarp, opening loculicidally in 3 valves. Seeds irregularly ovoid-globular, the funicle expanded into a broad irregular strophiole; testa very thin, light brown, closely appressed; albumen rather hard. Embryo very small, near the hilum.—Perennials, with fibrous roots and simple or branched stems. Leaves sessile, ovate or lanceolate. Flowers terminal, pedicellate, solitary or several together in an umbel sessile within the last leaves.

The genus is limited to Australia.

Leaves with minutely undulate margins. Flowers solitary or rarely 2 together . . . . 1. *S. undulata.*
Leaves quite entire. Flowers usually above 10 in the umbel . 2. *S. multiflora.*

1. **S. undulata,** *R. Br. Prod.* 274.—Fibrous roots often swollen into small tubers. Stems slender, diffuse and branching at the base, ascending or erect, rarely much above 6 in. high. Leaves ovate-lanceolate, varying however in breadth, 1 to nearly 2 in. long, membranous, with slightly prominent nerves, the margins minutely undulate. Flowers pale lilac, solitary or rarely 2 together at the ends of the branches, on pedicels of ½ to 1 in. without bracts. Perianth-segments usually about 4 lines long, oblong, almost acute, either wholly flat when fully out or

remaining concave at the base. Ovules 4 to 6 in each cell.—F. Muell. Fragm. vii. 71; Bot. Mag. t. 2712.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and many others; Newcastle, *Leichhardt*; Illawarra, *A. Cunningham*; Cape Howe Ranges, *Walter*.

2. **S. multiflora,** *R. Br. Prod.* 274.—Stems from a knotted rhizome, rather more rigid than in *S. undulata*, simple or branched, mostly 6 in. to nearly 1 ft. high. Leaves of the size of those of *S. undulata* but rather firmer, not so broad at the base and almost shining with the margins quite entire, several of the upper ones close together forming an involucre round the umbel. Flowers pure white, several (usually above 10) together in a terminal umbel sessile within the last leaves, with sometimes a few minute bracts at the base of the pedicels besides the involucral leaves. Pedicels filiform, ¾ to 1 in. long. Perianth-segments about 4 lines long as in *S. undulata*, but rather more rigid. Ovules usually 4 in. each cell; seeds only 1 or 2.—F. Muell. Fragm. vii. 72.

Queensland. Endeavour River, *Banks and Solander*; Rockingham Bay, *Dallachy*; Cape York Peninsula, *Hann's Expedition*, *n.* 367; Cape York, *Daemel*.

19. KREYSIGIA, Reichb.

(Tripladenia, *Don*.)

Perianth of 6 distinct deciduous segments, all nearly equal and similar, induplicate or convolute round the corresponding stamens in the bud, spreading and flat when in flower as in *Schelhammera*, but bordered on each side near the base by a glandular appendage. Stamens 6, attached to the base of the segments and shorter than them; filaments tapering under the anther; anthers oblong, erect, the cells opening laterally in longitudinal slits, turned outwards when fully out. Ovary sessile, 3-angled, 3-celled, with 3 or 4 ovules in each cell; style deeply divided into 3 recurved lobes stigmatic along their inner edge. Capsule nearly globular, opening loculicidally in 3 valves. Seeds, according to Don, strophiolate, the embryo not completely enclosed in the albumen, but only covered by the strophiole. Perennial with a knotty rhizome and the simple stems and ovate or lanceolate leaves of *Schelhammera*, but the flowers axillary on a slender peduncle.

The genus is limited to the single species endemic in Australia; the structure of the seed requires further examination. It has only been described by Don, and those of our specimens are all fallen away from the capsules.

1. **K. multiflora,** *Reichb. Iconogr. Exot.* iii. 11, *t.* 229.—Stems from a knotty rhizome, ascending or erect, simple, flexuose, ¾ to 1½ ft. high. Leaves ovate or ovate-lanceolate, clasping the stem by their cordate base, acute, 2 to 3 in. long, with numerous prominent nerves connected by transverse veinlets. Peduncles axillary, bearing at their apex 1, 2 or rarely 3 flowers on filiform pedicels, with 3 or 4 linear bracts at the base of the pedicels and shorter than them, the whole inflorescence usually shorter than the leaves. Perianth-segments ovate or oblong,

about 4 lines long, but varying in size, the lateral appendages at their base either dilated or 2- or 3- or even 4-lobed at their glandular apex. Capsule 3 or 4 lines diameter.—Bot. Mag. t. 3905; F. Muell. Fragm. vii. 71; *Schelhammera multiflora*, Lodd. Bot. Cab. t. 1511, not of Br.; *Tripladenia Cunninghamii*, Don in Proc. Linn. Soc. 1839. 46, Ann. Nat. Hist. ser. 1. iv. 282.

Queensland. Pine River and Moreton Bay, *F. Mueller*.

N. S. Wales. Hastings River, *Fraser*, *A. Cunningham*, *Beckler*; Richmond River, *C. Moore*, *Henderson*, and others; Macleay River, *Guilfoyle*; Tweed River, *Fitzgerald*; Clarence River, *Wilcox*.

20. BURCHARDIA, R. Br.

Perianth of 6 distinct deciduous segments, all nearly equal and similar, induplicate or convolute round the corresponding stamens in the bud, spreading and flat when in flower. Stamens 6, attached to the base of the perianth-segments and shorter than them; filaments flattened towards the base; anthers linear-oblong, attached near the base, the cells opening outwards in longitudinal slits. Ovary sessile but tapering at the base, prominently 3-angled, 3-celled, with numerous ovules superposed in 2 rows in each cell; style short, with 3 recurved stigmatic lobes. Capsule oblong or ovoid, deeply 3-furrowed and obtusely 3-angled, opening septicidally in 3 valves, with marginal placentæ. Seeds angular, with a brown thin adnate testa. Embryo small, in a fleshy albumen, not far from the hilum.—Herb with a fibrous root, and simple or slightly branched stem, with few narrow leaves not distichous. Flowers in a terminal umbel, a few outer bracts forming a small involucre.

The genus is limited to the single Australian species.

1. **B. umbellata,** *R. Br. Prod.* 273.—Stem enclosed at the base in a few brown sheaths of old leaves but not bulbous, 1 to 2 ft. high, usually simple but occasionally with 1 or 2 erect branches. Leaves 1 to 3 at the base of the stem, narrow-linear, concave, 3 to 6 in. long, with a sheathing base, the upper leaves few, much shorter or reduced to sheathing bracts. Flowers several often numerous in the umbel, irregularly sometimes partially centrifugally developed, varying however in number as well as size, each one in the axil of a small bract, 2 or 3 of the outer bracts often larger forming an involucre but always much shorter than the pedicels, which vary in length from a few lines to 2 in. Perianth-segments white, oblong or elliptical, usually about 4 lines, but varying from 3 to 6 lines long. Capsule when full grown attaining about ½ in.—Hook. f. Fl. Tasm. ii. 46; Endl. in. Pl. Preiss. ii. 44; *B. multiflora* and *B. congesta*, Lindl. Swan Riv. App. 58; Endl. l.c.

N. S. Wales. Port Jackson, *R. Brown*, *Sieber*, n. 153, 154, and others; northward to Hastings River, *Beckler*; Richmond River, *Henderson*; southward to Illawarra, *A. Cunningham*.

Victoria. Wendu Vale, *Robertson*; Port Phillip, *Gunn*; about Melbourne, *Adamson*, *F. Mueller*.

Tasmania. Northern parts of the island, *Gunn* and others.
S. Australia. Very abundant from St. Vincent's Gulf to the Murray, *Behr, F. Mueller*, and others; Port Lincoln, *Wilhelmi.*
W. Australia. From King George's Sound to Swan and Murchison Rivers, *Drummond,* 1*st coll. and n.* 783; *Preiss, n.* 1604, 1607, 1608, and others.

The variations in the size of the flowers are nearly equally observable in all the colonies; some of the Swan River specimens are in every respect the most luxuriant, but others again are as starved and small-flowered as any eastern ones.

TRIBE 9. ANTHERICEÆ. Perianth segments free or very shortly united at the base. Style undivided, with a small terminal entire or slightly 3-dymous stigma. Stock not bulbous. Flowers racemose, paniculate or umbellate, rarely solitary. Bracts thinly scarious usually hyaline or none, not glume-like.

21. BULBINE, Linn.

Perianth deciduous, of 6 equal segments, free or slightly connected at the base. Stamens 6, attached to the base of the perianth, and shorter than its segments; filaments filiform or shortly dilated at the base, bearded above the middle by a dense tuft of filiform or clavate hairs; anthers oblong-linear, usually recurved or twisted after shedding the pollen, the cells opening inwards in longitudinal slits. Ovary sessile, 3-celled, with several ovules in each cell superposed in 2 rows; style filiform, with a terminal stigma. Capsule nearly globular, 3-valved. Seeds few, angular, black, the testa opaque, smooth or tubercular-granulate.—Perennials, with fibrous roots proceeding sometimes from a thick tuber under the stock. Leaves radical or crowded at the base of the stem, with short sheaths. Scape simple, leafless. ending in a simple raceme of yellow flowers, the pedicels solitary within a scarious bract, and articulate immediately under the flower.

Besides the two species endemic in Australia, there are a considerable number natives of South Africa.

Perianth usually about ½ in. long or more. All the filaments bearded. Root often tuberous . . . . 1. *B. bulbosa.*
Perianth about ¼ in. Only the 3 inner filaments bearded. No tuber to the root . . . . 2. *B. semibarbata.*

1. **B. bulbosa,** *Haw. Rev. Pl. Succ.* 33.—Root in old plants forming a bulb-shaped tuber immediately under the stock, but not really bulbous. Leaves all radical, linear-subulate, rather thick, grooved in front, from under 6 in. to above 1 ft. long, with very short sheathing bases. Scapes 1 to 2 ft. high, the raceme when fully out often above 6 in. long. Scarious bracts varying from very short to half as long as the pedicels. Pedicels erect, rarely longer than the flower when first out. but lengthening more or less after flowering. Perianth-segments oblong, usually 5 to 6 lines long, but sometimes at least 8 lines, yellow, with a narrow dark obscurely 3-nerved centre. Filaments all equal or the inner ones longer, the tuft of hairs sometimes very short immediately under the anther or

rather below it, sometimes occupying the upper half of the filament with the anther almost buried in it; but I have always seen the anther itself quite glabrous, usually shorter than the filament. Capsule erect, about 3 lines diameter, ripening 1 or 2 seeds in each cell.—Baker in Journ. Linn. Soc. xv. 345; Hook. f. Fl. Tasm. ii. 51; F. Muell. Fragm. vii. 70; *Anthericum bulbosum*, R. Br. Prod. 275; Bot. Mag. t. 3017; *A. semibarbatum*, Hook. Bot. Mag. t. 3129, not of R. Br.; *Bulbine australis*, Spreng. Syst. ii. 86; *B. suavis*, Lindl. in Bot. Reg. 1838, Misc. 45; *B. Fraseri* and *B. Hookeri*, Kunth, Enum. iv. 565, 566.

Queensland. Moreton Bay, *F. Mueller*; Condamine River, *Leichhardt*; Darling Downs, *Woolls*; Curriwillighie, *Dalton*; Burnet River, *Haly*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls*, and others; northward to New England, *C. Stuart*; Clarence River, *Beckler*; in the interior from the Darling to the western frontier, *Dallachy*, *Mitchell*, and others.

Victoria. From the Glenelg and lower Yarra, *Robertson*, *Adamson*, *F. Mueller*, and others, to Wimmera, *Dallachy*.

Tasmania. Abundant in rocky places throughout the island, *J. D. Hooker*.

S. Australia. St. Vincent's Gulf, *F. Mueller*; Yorke Peninsula, *Miss Salmon*.

Some specimens from the islands of Bass's Straits, *Wilhelmi*, and Mount Buller, *F. Mueller*, show a very large variety, with long, thick succulent leaves. Some of the northern ones are small and slender, with narrow leaves, and the beard of the filaments smaller than usual; the hairs of the beards are, however, very variable in length, number, and density, and in the greater or less admixture of clavate hairs. The figure in Bot. Mag. t. 3017, representing the anthers as well as the filaments hairy in their whole length, must have been a mistake, as they are not so in the typical specimen preserved. The description was probably drawn up in that respect from the plate.

Some specimens sent by Gunn, as gathered in a shrubbery near Georgetown, with a note that they possibly have been introduced, appear to be the *B. longiscapa*, Willd., a South African species long cultivated in European gardens.

2. **B. semibarbata,** *Haw. Rev. Pl. Succ.* 33.—Roots fibrous, without any tubers under the stock. Leaves usually narrow-linear, but varying in length almost as much as in *B. bulbosa*. Scapes from a few in. to about 1 ft. high, the racemes looser and the flowers fewer and smaller than in *B. bulbosa*. Perianth rarely above 3 lines long, and the pedicels usually longer. Stamens 3 opposite the outer segments almost hypogynous, the filaments short without beards, 3 attached to the base of the inner segments with much longer filaments bearded above the middle or immediately under the anther, as in *B. bulbosa*. Capsule rarely above 2 lines diameter, ripening 3 or 4 black angular seeds, often coarsely reticulate or tuberculate on the angles.—Baker in Journ. Linn. Soc. xv. 349; Hook. f. Fl. Tasm. ii. 52; F. Muell. Fragm. vii. 70; *Anthericum semibarbatum*, R. Br. Prod. 275; *Bulbine floribunda*, Schrad. in various Botanical Gardens; *Triglochin racemosum*, Endl. in Pl. Preiss. ii. 54.

Queensland. Moreton Bay, *C. Stuart*; Ballandool River, *Locker*.

N. S. Wales. In the interior at Nangas, *M'Arthur*; Darling River, *Mrs. Forde*; Upper Bogan and Lachlan Rivers, *L. Morton*; Stokes Range to Cooper's Creek, *Wheeler*.

Victoria. Generally distributed over the colony, *F. Mueller* and others.

Tasmania. Port Dalrymple, *R. Brown*; common in moist and marshy places in various parts of the island, *J. D. Hooker*.

S. Australia. Memory Cove, *R. Brown*; round St. Vincent's Gulf, *F. Mueller* and others; Yorke Peninsula, *Fowler*; Kangaroo Island, *R. Brown*, *F. Mueller*.

W. Australia. King George's Sound and adjoining districts, *R. Brown*, *F. Mueller*, and many others; Blackwood River, *Oldfield*; Lake Muir, *Muir*; Rottenest Island, *Preiss*, *n.* 2407.

22. AGROSTOCRINUM, F. Muell.

Perianth with a campanulate persistent base, articulate above the ovary, with 6 oblong spreading 5-nerved segments, spirally twisted after flowering, and at length deciduous. Stamens 6, hypogynous, slightly declinate, shorter than the perianth; filaments short, glabrous, scarcely flattened; anthers linear, longer than the filaments, opening in terminal pores. Ovary sessile, 3-celled, with 2 collateral erect ovules in each cell; style filiform, with a small terminal stigma. Capsule nearly globular, surrounded by the truncate persistent base of the perianth, 3-valved. Seeds 1 or 2 in each cell; obovoid or nearly globular, with a small fugacious strophiole; testa crustaceous, black, smooth and shining.—Stems erect, with narrow leaves not crowded. Flowers blue in a loose terminal raceme, with a minute bract under each pedicel.

The genus is limited to the single species endemic in West Australia.

1. **A. stypandroides**, *F. Muell. Fragm.* ii. 95, vii. 65.—Stems erect, simple, often 2 to 3 ft. high, glabrous below, but more or less scabrous-hirsute under the inflorescence. Leaves narrow-linear, with rather long sheaths, quite closed round the stem, and flattened with an acute keel. Flowers blue and showy, the raceme simple or once branched. Pedicels filiform, rather distant, often above 1 in. long, usually scabrous-hirsute as well as the rhachis. Perianth 6 to 8 lines long, the campanulate persistent base about 1 line long when in flower, 2 lines long round the fruit, the segments all 5-nerved, and equal in length, the outer ones more opaque, with narrow margins, the inner ones with broad nerveless margins. Capsule about 2 lines diameter.—*Stypandra scabra*, R. Br. Prod. 279; Endl. in Pl. Preiss. ii. 35; *Cæsia hirsuta*, Lindl. Swan Riv. App. 57; *Cæsia scabra*, Baker in Journ. Linn. Soc. xv. 359; *Arthropodium scabrum*, Spreng. Syst. ii. 87.

W. Australia. Lucky Bay, *R. Brown*; King George's Sound to Swan River, *A. Cunningham*, *Drummond*, *1st Coll. and No.* 775, 776, *Preiss*, *n.* 1538, *Oldfield* and others; eastward to Cape Arid and Cape Paisley, *Maxwell*. Sent by F. Barlee, with a long leafy form of *Stypandra glauca*, as the plant called *blind grass*, because it is supposed to cause blindness in cattle and sheep that eat of it.

23. THYSANOTUS, R. Br.

(Chlamysporum, *Salisb.*)

Perianth spirally twisted over the ovary after flowering, but sometimes at length deciduous, of 6 distinct segments, all nearly equal in

length, with an opaque 3-nerved centre, the 3 outer usually narrow, acute with narrow thin entire margins, the 3 inner with broad coloured margins, rolled inwards over the inner stamens in the bud, and elegantly fringed on the edges. Stamens 3 opposite the outer segments hypogynous or sometimes wanting, 3 attached to the base of the inner segments, all more or less declinate in the expanded flower, shorter than the perianth; filaments short or rarely nearly as long as the anthers; anthers linear, the parallel cells confluent at the apex and opening longitudinally, the inner valve shorter and narrower than the outer one, those of the inner stamens usually longer than the others, and often terminating in a long narrow beak. Ovary sessile or contracted into a short thick stipes, 3-celled, with 2 superposed ovules in each cell; style filiform, undivided. Capsule usually globular, 3-valved. Seeds 1 or 2 in each cell, not flattened, the upper one erect, the lower pendulous, the funicle expanded into a white or yellowish strophiole; testa black, thickly membranous or almost crustaceous.—Perennials with a tufted or thick often horizontal stock and fibrous roots thickened into tubers in some species. Leaves radical, grass-like. Scapes leafless or nearly so, simple or variously branched. Flowers in terminal or rarely lateral umbels rarely reduced to a single flower. Bracts short scarious imbricate. Pedicels articulate below the middle.

The species are all Australian, but one of them extends to the Philippine Islands and South China. They are often very difficult to discriminate, especially from dried specimens in which the roots and radical leaves supplying some of the most constant characters are often deficient. The difference in proportion between the inner and outer stamens and the absence of the latter in some species may not be always so constant as would appear at first sight.

SERIES 1. **Triandræ.** *Stamens 3. Stock densely tufted, with numerous radical leaves shorter than the scape. Species all Western.*

Scape simple, with a single many-flowered terminal umbel, or very rarely a second sessile one lower down.
  Plant quite glabrous . . . . 1. *T. multiflorus.*
  Leaves hirsute or ciliate . . . . 2. *T. triandrus.*
Scape and leaves slender. Umbels few-flowered, several, often numerous in a dense terminal panicle.
  Roots fibrous, without tubers . . . . 3. *T. glaucus.*
  Roots tuberous . . . . 4. *T. Drummondii.*
Scape slender, low, with a single few-flowered umbel . . 5. *T. pauciflorus.*

SERIES 2. **Hexandræ.** *Stamens 6, 3 usually but not always longer than the others.*

Stock densely tufted, with numerous radical leaves. No tubers. Umbels single.
  Rigid and hirsute. Flowers 9 to 10 lines long, on short pedicels. Western species . . . . 6. *T. asper.*
  Slender and glabrous. Flowers 3 to 4 lines long, on long pedicels. Tropical species . . . . 7. *T. chrysantherus.*
Stock usually tufted, with several radical leaves often rather long. Roots often tuberous. Scape paniculate at the end, with several few-flowered umbels.
  Radical leaves numerous and narrow. Scapes short. Panicles compact, umbels often very few. Western species.
    Stamens all nearly equal . . . . 8. *T. isantherus.*
    Stamens 3 distinctly longer than the others . . . 9. *T. tenellus.*

Radical leaves not very numerous, often long. Umbels usually numerous.

Leaves rather thick. Panicle short, rigid, much-branched. Bracts 2 to 3 lines long. Western species . . . . 10. *T. scaber.*

Leaves very narrow. Panicle loose. Bracts 1 to 2 lines long. Species chiefly Eastern or Southern.

Stamens 3 distinctly longer than the others . . . 11. *T. tuberosus.*

Stamens all nearly equal . . . . 12. *T. exasperatus.*

Leaves very narrow. Panicle thyrsoid, much-branched and compact but slender. Western species . . . . 13. *T. thyrsoideus.*

Stock and leaves unknown. Umbels few-flowered, several sessile along the upper part of a simple or slightly-branched scape, with broad white bracts. Southern species . . . . 14. *T. Baueri.*

Roots tuberous. Leaves few. Stem twining, often much branched and intricate . . . . 15. *T. Patersoni.*

Stock thick, usually horizontal. No tubers. Leaves few, small, and withering early. Umbels mostly terminal, 1- to 3-flowered.

Stems with slender elongated terete branches. Eastern species . . . . 16. *T. junceus.*

Stems rigid, terete, the branches sometimes elongated and rush-like, more frequently flexuose or intricately dichotomous. Western species . . . . 17. *T. dichotomus.*

Flowering stems as in *T. dichotomus*, but others flowerless from the same stock, with a compact panicle of numerous short dichotomous branchlets. Western species . . . . 18. *T. arbuscula.*

Stems rigid, flattened, with the margins acute or winged. Western species . . . . 19. *T. anceps.*

SERIES 1. TRIANDRÆ. Stamens 3 only. Stock in all the species tufted, with numerous radical leaves shorter than the stock.

1. **T. multiflorus,** *R. Br. Prod.* 285.—Stock densely tufted, with fibrous roots, without tubers. Leaves all radical, numerous, densely tufted, erect, rigid, nearly 1 line broad, and much shorter than the scape in the typical form, very narrow and short in some specimens, long flaccid and sometimes exceeding the scape in luxuriant specimens of the var. *prolifer*. Scapes simple, 6 in. to 1 ft. or rarely 1½ ft. high, bearing a single terminal umbel of numerous flowers, or rarely a second one lower down. Pedicels usually longer than the perianth. Perianth-segments about 6 lines long, the outer ones very acute, the inner rather shorter. Stamens 3 only, opposite the inner segments, with short flat filaments; anthers equal, about half as long as the perianth.—Baker in Journ. Linn. Soc. xv. 340; F. Muell. Fragm. vii. 69.

W. Australia. King George's Sound, *R. Brown*, *Baxter*, *F. Mueller*; and thence to Swan River, *Drummond*, *1st coll.*, *Preiss*, *Oldfield*, and others.

Var. *prolifer*. A luxuriant form, with long narrow leaves and a large many-flowered terminal umbel, with frequently a second one rather lower down.—*T. proliferus*, Lindl. Bot. Reg. 1838, t. 8; Endl. in Pl. Preiss. ii. 38, Maund, Botanist, t. 187.—Swan River, *Drummond*, *Preiss*, *n.* 1572.

T. brevipes, Endl. in Pl. Preiss. ii. 38 from King George's Sound, *Preiss*, *n.* 1573, is founded on what appears to be small starved specimens of *T. multiflorus*, with fewer flowers.

2. **T. triandrus,** *R. Br. Prod.* 284.—Closely resembles the medium or smaller specimens of *T. multiflorus*, and varies equally in stature and in the length and breadth of the leaves, but the leaves and often the base of the scape are more or less hirsute with short rigid pellucid hairs.—Baker in Journ. Linn. Soc. xv. 340; Endl. in Pl. Preiss. ii. 38; F. Muell. Fragm. vii. 69; *Ornithogalum triandrum*, Labill. Pl. Nov. Holl. i. 84, t. 110; *Thysanotus hispidulus*, R. Br. Prod. 285; Baker in Journ. Linn. Soc. xv. 341; *T. nanus*, Endl. in Pl. Preiss. ii. 38.

W. Australia. King George's Sound and adjoining districts, *Labillardière*, *R. Brown*, *Preiss*, *n.* 1571, 1574, *Oldfield*, and others; thence to Swan River, *Drummond*, *1st coll.*, and eastward to Cape Legrand and Esperance Bay, *Maxwell*.

3. **T. glaucus,** *Endl. in Pl. Preiss.* ii. 38.—Stock densely tufted, with fibrous roots not tuberous. Leaves numerous, densely tufted, linear-subulate, nearly terete, much shorter than the scape. Scapes 6 in. to nearly 1 ft. high, erect, slender but rigid, leafless, simple below the inflorescence. Flowers in umbels of 2 or 3, terminating the branches of a terminal dichotomous somewhat corymbose panicle. Pedicels short. Perianth about ⅓ in. long, the outer segments linear-lanceolate, acute, the inner with a prominent dorsal ridge or wing. Stamens 3, with short flat filaments.—Baker in Journ. Linn. Soc. xv. 341.

W. Australia. Swan River, *Drummond*, *Preiss*, *n.* 1575.

4. **T. Drummondii,** *Baker in Journ. Linn. Soc.* xv. 341.—Stock densely tufted, with fibrous roots, many of them swollen into tubers. Leaves numerous, densely tufted, linear-filiform, 6 to 8 in. long, quite glabrous. Scape very slender, as long as or sometimes exceeding the leaves. Flowers in umbels of 2 to 3, terminating the branches of a close terminal panicle. Pedicels ¼ to ⅓ in. long. Perianth under ⅓ in. long. Stamens 3 only.

W. Australia. Swan River, *Drummond*, several specimens in Herb. DC., which I have not seen. The species, according to Mr. Baker, is very near *T. glaucus*, but with fewer leaves, not so rigid, and the roots tuberous.

5. **T. pauciflorus,** *R. Br. Prod.* 285.—A small plant with the aspect of some specimens of *T. isantherus*, and quite glabrous. Leaves tufted, narrow, slender, the longest at least as long as the scape. Scapes 2 to 4 in. high, bearing a single terminal umbel of 1 to 3 flowers, the outer bracts acuminate and one sometimes almost leafy apparently continuing the stem. Perianth 4 to 5 lines long. Anthers 3 only, declinate, about half as long as the perianth.—Baker in Journ. Linn. Soc. xv. 341.

W. Australia. King George's Sound, *R. Brown*.

Series 2. Hexandræ. Stamens 6, 3 of them usually but not always longer than the others, and often produced into a narrow beak.

6. **T. asper,** *Lindl. Swan Riv. App.* 58.—Stock densely tufted, with

the fibrous roots not tuberous, and general habit of *T. triandrus.* Leaves much shorter than the scape, numerous, rather narrow, rigid, erect, hirsute. Scape 1 ft. high or more, erect, rigid, hirsute, bearing a single terminal umbel of 3 to 6 flowers the largest in the genus. Perianth-segments 8 or 9 lines long, the outer ones with very narrow margins. Stamens 6, very unequal, the 3 longer ones ending in long narrow beaks.—Baker in Journ. Linn. Soc. xv. 338.

W. Australia. Swan River, *Drummond, 1st coll.*

7. **T. chrysantherus,** *F. Muell. Fragm.* v. 202.—Stock tufted, with fibrous roots not tuberous. Radical leaves rather numerous, very narrow, shorter than the scape. Scape slender, simple, 6 in. to above 1 ft. long, bearing a single umbel of 3 to 6 flowers. Pedicels filiform, much longer than and sometimes 3 times as long as the perianth. Perianth usually about 4 lines long. Stamens 6, 3 of them longer but not very much longer than the 3 others. Seeds with a white strophiole.—Baker in Journ. Linn. Soc. xv. 337, under *T. chinensis.*

N. Australia. Foot of M'Adam Range, *F. Mueller;* Port Essington, *Armstrong.*

T. chinensis, Benth. Fl. Hongk. 372, from South China and the Philippine Islands, which I had erroneously (as noted by Hance in Ann. Sc. Nat. ser. 5, v. 245) described from a dried specimen as having no fringe to the inner perianth-segments, does not appear to be specifically distinct from *T. chrysantherus.*

8. **T. isantherus,** *R. Br. Prod.* 283.—A small glabrous tufted species, with fibrous roots swollen into tubers distant from the stock. Leaves very fine, rather numerous, often as long as the scape. Scape under 6 in. high, slender, ending in a small almost corymbose panicle. Umbels few, all pedunculate, flowers usually 2 or 3 in the umbel, on pedicels rather shorter than the perianth. Perianth-segments 4 to 5 lines long. Stamens 6, all equal or nearly so, the anthers not at all beaked.

W. Australia. King George's Sound, *R. Brown;* Mount Melville and Upper Kalgan River, *F. Mueller;* Perongerup, *Mrs. Knight.*

The numerous specimens I have now seen of this plant show that it is quite distinct from the tropical *T. chrysantherus,* to which Baker doubtfully refers it.

9. **T. tenellus,** *Endl. in Pl. Preiss.* ii. 37.—Stock tufted, the fibrous roots swollen into tubers usually distant from the stock. Leaves more numerous and finer than in most of the tuberous-rooted species, rather shorter than the scape, with short scarious sheaths. Scape 6 to 9 in. high, simple below the inflorescence, which forms a short rather dense somewhat corymbose panicle. Umbels all pedunculate, usually 3- or 4-flowered, the scarious bracts often numerous. Pedicels rather longer than the perianth when fully out. Perianth-segments 4 to 5 lines long. Stamens 6, 3 of them longer than the 3 others.

W. Australia. Swan River, *Drummond, 1st coll. and n.* 802, *Preiss, n.* 1577.

Baker, in Journ. Linn. Soc. xv. 337, refers this to the *T. tenuis*, Lindl. Bot. Reg. 1838, t. 50, and it may be really only a variety, but the drawing represents longer and stiffer leaves, a very much looser dichotomous inflorescence as long as the undivided part of the stem, and the pedicels all much shorter than the perianth. Unfortunately it does not appear that any specimen was preserved, and the short description was evidently made from the drawing. The identity or distinctness of the two forms cannot therefore be determined until fresh specimens are seen.

10. **T. scaber,** *Endl. in Pl. Preiss.* ii. 37.—Roots fibrous without tubers in most of the specimens, although in one specimen several of them bear tubers. Leaves not very numerous, usually rather shorter than the scape, thick and rather rigid, broader than in *T. tuberosus*, and expanding at the base to 2 lines in breadth. Scape stout, flattened in the upper part, 1 to 1½ ft. high. Panicle short and rigid, the branches usually clustered three together, the ultimate ones bearing each an umbel of several flowers. Bracts 2 to 3 lines long, with a broad base, the inner scarious bracteoles more or less united. Perianth 5 to 6 lines long, on pedicels of 3 to 6 lines, the outer segments with rather broad imbricate margins. Stamens 6, all contracted into a terminal beak, 3 longer than the 3 others, the filaments at least half as long as the anthers.—Baker in Journ. Linn. Soc. xv. 336.

W. Australia. Swan River, *Drummond, Preiss, n.* 1578. Some imperfect specimens from Esperance Bay and Cape Legrand, *Maxwell*, seem almost to connect this species with *T. tuberosus*, although Drummond's specimens appear very different.

11. **T. tuberosus,** *R. Br. Prod.* 282.—Fibrous roots swollen into tubers more or less distant from the stock. Leaves radical, not numerous, narrow-linear, varying from quite short to at least as long as the scape, rarely above 1 line broad and sometimes very fine. Scape erect, rigid, terete, 6 in. to above 1 ft. high, branching into a loose irregularly dichotomous panicle, varying from narrow-pyramidal to almost corymbose, each branch terminating in an umbel of 1 to 3 or 4 flowers, with sometimes a second umbel sessile on the branch rather lower down. Bracts under the branches and pedicels lanceolate, acute, 1-nerved, with scarious margins, and usually 2 short broad scarious bracteoles (often united into one) at the base of each pedicel. Perianths when full-grown 6 to 7 lines long in the larger varieties, scarcely above 4 lines in a few specimens, on pedicels varying from 3 or 4 lines to twice that length. Stamens 6, the 3 opposite the inner segments nearly as long as the perianth, ending in a narrow beak; the 3 others shorter, often much shorter, but the proportions very variable, and sometimes 1 or 2 of the longer ones fully twice the short ones.—Baker in Journ. Linn. Soc. xv. 335; F. Muell. Fragm. vii. 69; Charsley, Wild Pl. Melb. t. 6, f. 1; *T. isantherus*, Lindl. Bot. Reg. t. 655, not of R. Br.

N. Australia. Islands off the north coast (Arnhem's Land), *R. Brown*; Arnhem's Land, *M'Kinlay*; Port Essington, *Armstrong*.

Queensland. Broad Sound, *R. Brown*; from Moreton Bay, *F. Mueller*, and many others, to Rockhampton, *Bowman*, *O'Shanesy*, and others; and Rockingham Bay, *Dallachy*; Port Curtis, *M'Gillivray*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, *n.* 499, and many others; northward to Liverpool Plains, *C. Moore;* New England, *C. Stuart;* Hastings, Clarence, and Macleay Rivers, *Beckler* and others; southward to Illawarra, *Shepherd.*

Victoria. Dandenong Ranges and the Grampians to Genoa River, *F. Mueller* and many others.

S. Australia. Flinders Range, *F. Mueller ;* Central Australia, *Gosse.*

W. Australia? Some specimens from Tone and Kalgan Rivers, *Oldfield*, are not distinguishable from some eastern forms of *T. tuberosus*, and possibly *T. scaber* may be only an extreme variety.

T. elatior, R. Br. Prod. 283, as generally understood and as probably meant by Brown when indicating Port Jackson as the station, is a tall strong many-flowered form, not uncommon in N. S. Wales and Queensland, but the specimens marked *T. elatior* in Herb. R. Br. are a tall slender form with few umbels from the islands off the N. coast.

T. paniculatus, R. Br. Prod. 283, Baker in Journ. Linn. Soc. xv. 337, and *T. Banksii*, R. Br. Prod. 283, belong to a rather slender form frequent in Queensland, with a rather loose pyramidal panicle.

Var. *parviflora*, from New England and Moreton Bay, only differs in the perianths, scarcely above 4 lines long.

12. **T. exasperatus**, *F. Muell. Fragm.* i. 21.—Closely allied in every respect to the long-leaved forms of *T. tuberosus*, from which it cannot be distinguished except by the stamens, which are all equal in length, or very nearly so, as in *T. isantherus.* How far this character may be constant remains to be proved.—Baker in Journ. Linn. Soc. xv. 385 adduces it as a synonym to *T. tuberosus.*

S. Australia. Flinders Range, *F. Mueller.*

13. **T. thyrsoideus**, *Baker in Journ. Linn. Soc.* xv. 386.—Root-fibres swollen into oblong tubers at a distance from the stock. Leaves usually very few, narrow, flaccid, often as long as the scape. Scape erect, 6 in. to 1 ft. high, terminating in a compact but slender much-branched pyramidal panicle of 3 to 6 in., the branches terminating in umbels of 1 to 3 flowers. Perianths 4 to 5 lines long, on filiform pedicels, the segments narrow. Stamens 6, 3 longer than the others.

W. Australia. Swan River, *Drummond*, 1*st coll.;* Champion Bay, *Oldfield;* Perongerup, *E. Knight.* Though very different in aspect from *T. tuberosus*, this species is not easily distinguished by positive characters.

14. **T. Baueri**, *R. Br. Prod.* 283.—Root-fibres swollen into ovoid or oblong tubers, generally distant from the stock. Leaves not numerous, narrow, usually much shorter than the scape, with rather broad scarious sheaths, but all withering very early, most specimens being quite leafless. Scape from under 6 in. to near 1 ft. high, simple including the inflorescence or slightly branched in the upper part. Umbels mostly 2- or 3-flowered, and usually several sessile along the upper part of the scape and its branches, besides the terminal one, the scarious bracts often rather large. Pedicels rather shorter than the perianth. Perianth-segments varying in size as in other species, but rarely under 4 or above 5 lines long, the opaque centres very dark in the dried specimens. Stamens 6,

unequal, but the 3 longer ones sometimes not much exceeding the others. —F. Muell. Fragm. vii. 69; Baker in Journ. Linn. Soc. xv. 336, but not the northern *T. Banksii* given as a synonym.

N. S. Wales. Between the Darling and Lachlan Rivers, *Burkitt.*
Victoria. Murray River and Wimmera, *F. Mueller.*
S. Australia. Around St. Vincent's Gulf, *F. Mueller.*

T. humilis, F. Muell. Fragm. i. 22, appears to me to be the same species. It is described as having the stamens all equal, but in the flowers I examined three were decidedly longer. In some specimens the lateral umbels were wanting, but in others there were three or four, as in the normal form. No specimen of the species is to be found in Brown's herbarium, but his character leaves no doubt as to its identity.

15. **T. Patersoni,** *R. Br. Prod.* 284.—Roots tuberous, oblong, clustered and close to the stock. Radical leaves few and mostly reduced to a sheathing scarious scale with a short linear subulate blade and withering early, the specimens usually leafless except the small linear scales under the branches. Stems slender, wiry, twining, but generally low, intricately branched in the flowering part. Flowers solitary or very rarely 2 together on the ultimate branches or terminal peduncles, with a pair of small bracts at the articulation 1 to 2 lines below the perianth. Perianth-segments varying from 3 to 5 lines long. Stamens 6, 3 of them longer than the others, but in variable proportions. Capsule globular, 2 to 3 lines diameter.—Baker in Journ. Linn. Soc. xv. 340; Hook. f. Fl. Tasm. ii. 54; F. Muell. Fragm. vii. 69; *T. Menziesii*, R. Br. Prod. 284; *T. Manglesianus*, Kunth, Enum. iv. 616; Endl. in Pl. Preiss. ii. 37.

N. S. Wales. Nangas, *M'Arthur;* Lake George, *Woolls;* Paterson River, *Vicary.*
Victoria. Wendu Vale, *Robertson;* Portland, *Allitt;* Port Phillip, *Gunn;* Melbourne and Upper Yarra, *F. Mueller* and others.
S. Australia. Yorke Peninsula, *Fowler;* St. Vincent's Gulf, *F. Mueller* and others; Rivoli Bay, *F. Mueller.*
Tasmania. Creeping amongst grass, not uncommon in many parts of the island, but easily overlooked, *J. D. Hooker.*
W. Australia. King George's Sound, *Menzies;* apparently common from thence to Swan and Murchison Rivers, *Drummond*, 1*st coll.*, *Preiss*, *n.* 1568, *Oldfield*, and many others. The western specimens have usually but not always larger flowers than the eastern ones, but do not otherwise differ. The twining stems are peculiar to this species, except a slight tendency to it in some exceptional forms of *T. dichotomus*, which, however, has never tuberous roots.

16. **T. junceus,** *R. Br. Prod.* 283.—Rhizome thick, horizontal when old, with fibrous roots without tubers. Radical leaves few, narrow-linear, short and soon withering away. Stems slender, loosely branched, erect or flexuose, 1 to 2 ft. high, bearing sometimes a short leaf near the base, and linear scarious scales under the branches. Umbels of 1 to 3 flowers, terminal and sometimes 1 or 2 sessile along the branches lower down. Pedicels 3 to 6 lines long, or even longer when in fruit, the articulation often close to the base. Perianth-segments 5 to 6 lines long.

Stamens 6, 3 of them longer than the others.—Baker in Journ. Linn. Soc. xv. 388; F. Muell. Fragm. vii. 69; Bot. Mag. t. 2351; Bot. Reg. t. 656; *Chlamysporum junciſolium*, Salisb. Parad. Lond. t. 103.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Woolls*, and others; Hastings River, *Beckler*; Newcastle, *Leichhardt*.

17. **T. dichotomus**, *R. Br. Prod.* 284.—Rhizome thick, horizontal when old, with fibrous roots without tubers. Radical leaves few, short, withering early. Stems exceedingly variable in habit, sometimes erect, loosely branched, and 1 to 2 ft. high, as in *T. junceus*; but usually more rigid, sometimes with long and spreading solitary or clustered branches, or very flexuose and repeatedly forked so as to be as intricate as in *T. Patersoni*, rarely almost twining, when much branched the lower branches without flowers, and all leafless except the very small scarious scales or bracts, terete and more or less striate or angular. Umbels all terminal, reduced to 1 or 2 or rarely 3 flowers, the bracts very small, the pedicels shorter than the perianth. Perianth-segments 5 to 6 lines long, often very deeply coloured in the dry state. Stamens 6, the anthers of the 3 longer ones usually ending in long beaks.—Baker in Journ. Linn. Soc. xv. 339; F. Muell. Fragm. vii. 69; *Ornithogalum dichotomum*, Labill. Pl. Nov. Holl. i. 83, t. 109; *Thysanotus divaricatus*, R. Br. Prod. 284; *T. sparteus*, R. Br. l. c. 283; Endl. in Pl. Preiss. ii. 37; Baker in Journ. Linn. Soc. xv. 338; *T. intricatus*, Endl. in Pl. Preiss. ii. 37; Bot. Reg. 1840, t. 4; *T. anceps*, Endl. l.c. not of Lindl.; *T. Lindleyanus*, Endl. l.c. 36.

Victoria. Glenelg River, *Robertson, F. Mueller.*

S. Australia. St. Vincent's Gulf and Kangaroo Island, *F. Mueller*; Port Lincoln, *Wilhelmi.*

W. Australia. King George's Sound, *Labillardière, R. Brown*, and many others, and thence to Swan and Murchison Rivers, *Drummond, n.* 191, 312, *Oldfield, Preiss, n.* 1563, 1564, 1565, 1569, and others; eastward to Cape Legrand and Esperance Bay, *Maxwell.*

This species is so variable in habit that, seeing only the extremes, it is difficult to believe that they ought to be considered as varieties only, but with the large herbaria of Kew and of F. Mueller before me, I find so gradual a passage from the erect virgate little-branched habit almost of *T. junceus*, to the very intricate and flexuose dichotomous specimens with the aspect almost of some forms of *T. Patersoni*, that I am unable to draw any definite lines of separation of marked varieties. Labillardière's typical form is not much branched, and the leaves are represented as linear and hispid as well as the base of the stem, but I have seen only a very few specimens quite answering to that character. In most specimens the leaves have quite disappeared, and the whole plant is glabrous. *T. deformis*, R. Br. Prod. 284, has the branches not numerous, very flexuose and almost scandent, with but few umbels. *T. flexuosus*, R. Br. l. c. 284, is a dwarf and very intricately-branched form. *T. elongatus* and *T. gracilis*, R. Br. l. c. 283, appear to me both to be very slender and elongated states of the species, although Baker retains them as distinct under the latter name. Of *T. tenuis*, Lindl. Bot. Reg. 1838, t. 50, we have no specimen; from the figure it may possibly be a reduced form of *T. dichotomus*, of which it has the short pedicels and other characters, but the anthers appear to be different. Baker in Journ. Linn. Soc. xv. 537 regards it as the same as *T. tenellus*, Endl. above, p. 40.

18. **T. arbuscula**, *Baker in Journ. Linn. Soc.* xv. 389.—Rhizome thick, horizontal, almost fleshy, with fibrous roots without tubers. Leaves few, short, and dying off early. Stems rather slender but rigid, erect, about 1 ft. high, simple and flexuose in the lower half, dichotomously paniculate in the upper part; some of the stems quite barren with the branchlets very numerous and short, the flowering stems taller with the branchlets longer and less numerous. Umbels and flowers of *T. dichotomus*, to which species this one also might be referrible, although the contrast of the barren and flowering stems give it a peculiar aspect.

W. Australia. Swan River, *Drummond*, 1*st coll.*

19. **T. anceps,** *Lindl. Swan Riv. App.* 58, *not of Endl.*—Root and leaves unknown. Stems erect, leafless, rigid, branching, 1 to 1½ ft. high, the branches flattened and bordered on each side by an acute edge or narrow wing, giving the whole branch a width of 1 to 2 lines. Umbels 2- or 3-flowered, usually solitary at the ends of the branches. Pedicels short. Perianth about ½ in. long, the outer segments very narrow.—Baker in Journ. Linn. Soc. xv. 389.

W. Australia. Swan River, *Drummond*, 1*st coll.*

24. HODGSONIOLA, F. Muell.

(Hodgsonia, *F. Muell., not of Hook. f.*)

Perianth twisted over the ovary after flowering, but at length deciduous, of 6 segments very shortly connected at the base, all equal or the inner ones rather smaller. Stamens 6, attached to the base of the perianth, 3 opposite the outer segments with very short filaments, and a small lanceolate anther with little or no pollen, 3 opposite the inner segments perfect, with rather longer filaments; anthers linear, entire, as long as the perianth, cohering round the style, the connectives produced beyond the narrow cells into a single tube. Ovary short, 3-celled, with 2 ovules (or sometimes only 1 ?) in each cell; style filiform, with a small capitate terminal stigma. Capsule broad, 3-furrowed, the pericarp rather thick, opening loculicidally in 3 valves. Seeds usually 1 in each cell, not flattened, with a black shining crustaceous testa. Albumen copious, embryo. . . .—Root fibrous. Leaves few, radical, linear-terete. Stem rush-like, simple, ending in a simple raceme. Pedicels filiform, each within a short linear or lanceolate scarious bract.

The genus is limited to the single Australian species.

1. **H. junciformis**, *F. Muell. Fragm.* ii. 176.—Leaves few, radical, slender, and rush-like, 3 to 6 in. long, shortly dilated and sheathing at the base, a few of the outer sheaths without any blade. Stems slender, 1 to 2 ft. high, entirely leafless or with a single scarious scale below the inflorescence. Raceme at first very short, but lengthening out to several inches, with rather numerous flowers. Pedicels scarcely as long as the perianth. Perianth-segments narrow, about 4 lines long. Capsule very

obtuse, rather more than 2 lines broad.—Baker in Journ. Linn. Soc. xv. 289; *Hodgsonia junciformis*, F. Muell. Fragm. ii. 96.

W. Australia. Vasse River, *Oldfield*, *Preiss*, and probably from the same neighbourhood, *Drummond*, *n.* 205.

25. CÆSIA, R. Br.

Perianth spirally twisted over the ovary after flowering, but at length deciduous, of 6 3-nerved segments, shortly united at the base, all equal in length, but the inner ones with broader thin margins. Stamens 6, attached to the base of the perianth, and (in the Australian species) shorter than the segments; filaments filiform; anthers oblong, shorter than the filaments, recurved, the cells opening inwards in longitudinal slits. Ovary sessile, 3-celled, with 2 superposed ovules in each cell; style slightly thickened upwards, undivided. Capsule depressed, obtusely 3-angled or 3-lobed, opening at length in 3 valves. Seeds usually solitary in each cell, globular, the short funiculus expanded into a small broad strophiole; testa black, crustaceous, tubercular-granulate.—Tufted herbs with fibrous roots more or less thickened into oblong tubers. Leaves grass-like, crowded at the base of the stem. Stems simple or branched. Flowers blue or rarely white, in clusters or sessile umbels along the upper portion of the stem or branches, forming terminal racemes. Bracts very short and scarious.

Besides the Australian species, which are all endemic and possibly varieties of a single one, there are several African ones.

Perianth-segments 3 to 4 lines long. Leaves often rather broad, not surrounded by filaments	1. *C. vittata.*
Perianth-segments under 3 lines long. Leaves rather broad or narrow, not surrounded by filaments.	
Leaves flaccid with fine nerves	2. *C. parviflora.*
Leaves rigid, with 3 to 5 very prominent nerves on each side	3. *C. rigidifolia.*
Perianth-segments under 3 lines long. Leaves very narrow, surrounded at the base by long filaments, the remains of old sheaths	4. *C. setifera.*

1. **C. vittata,** *R. Br. Prod.* 277.—Fibres more or less thickened into long tubers. Leaves crowded at the base of the stem, with more or less scarious sheaths and grass-like blades, very variable in length and breadth, but mostly shorter than the stem, a few much smaller at the base of the branches. Stem erect, simple, or with a few long branches, usually about 1 ft. high, but sometimes not half that length, and sometimes much longer, the inflorescence occupying more than the upper half. Umbels or clusters of 2 to 4 or rarely more flowers, sessile along the rhachis, surrounded by very short scarious bracts, the filiform pedicels within the umbel varying from 2 to 4 lines. Perianth-segments usually blue, 3 to 4 lines long. Capsule about 2 lines broad, depressed at the top, and more prominently lobed than in *Anthericum;* but when ripe opening at the top in 3 valves, as in that genus.—Baker in Journ.

Linn. Soc. xv. 358; Hook. f. Fl. Tasm. ii. 58; F. Muell. Fragm. vii. 68.

Queensland. Herbert Creek, *Bowman;* Warwick, *Beckler.*
N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, A. Cunningham, Woolls,* and others; northward to New England, *C. Stuart;* Hastings River, *Beckler;* Richmond River, *Fawcett;* southward to Illawarra, *A. Cunningham.*
Victoria. Wendu Vale, *Robertson;* from Port Phillip and the Yarra to Wimmera, *F. Mueller* and others.
Tasmania. Port Dalrymple, *R. Brown;* common in grassy places, especially in the northern parts of the island, *Gunn* and others.
S. Australia. St. Vincent's Gulf, *F Mueller* and others; Encounter Bay, *Whittaker;* Yorke Peninsula, *Fowler.*

Var. *chlorantha.* Perianth-segments white with a greenish centre. *C. chlorantha,* F. Muell. Fragm. i. 63; Baker in Journ. Linn. Soc. xv. 359.

N. Australia. Sturt's Creek, *F. Mueller.*
Queensland. Peak Downs, *F. Mueller.*

2. **C. parviflora,** *R. Br. Prod.* 277.—Closely allied in every respect to *C. vittata,* and scarcely more slender or with narrower leaves, but both the flowers and fruits much smaller, the perianth-segments under 3 lines long.—Baker in Journ. Linn. Soc. xv. 358; Hook. f. Fl. Tasm. ii. 58; F. Muell. Fragm. vii. 67; *C. occidentalis,* R. Br. Prod. 277; Endl. in. Pl. Preiss. ii. 33; Baker in Journ. Linn. Soc. xv. 358; *C. micrantha,* Lindl. Swan Riv. App. 57; Endl. l. c. 34.

Queensland. Moreton Bay, *Herb. F. Mueller;* Burnet River, *Daly;* Rockhampton? *Bowman.*
N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Woolls,* and others; northward to New England, *C. Stuart;* Clarence River, *Wilcox;* Richmond River, *Fawcett.*
Victoria. Yarra and Port Phillip, *F. Mueller.*
Tasmania. Port Dalrymple *R. Brown;* northern coasts of the colony at Georgetown, Launceston, etc., *Gunn* and others.
W. Australia. King George's Sound, *R. Brown* and many others; and thence to Vasse and Swan Rivers, *Drummond, n.* 335, *Oldfield, Preiss, n.* 1546, 1547, 1548, and others. Apparently common and not distinguishable from the small-flowered eastern plant, and perhaps the only species in West Australia, although one specimen from Champion Bay, *Miss Guerin,* has the flowers almost as large as in the common *C. vittata.*

3. **C. rigidifolia,** *F. Muell. Fragm.* x. 48.—Very nearly allied to *C. parviflora,* but at once known by the lower leaves 9 in. to 1 ft. long, very rigid, 1 to 1½ lines broad, tapering to a sharp point, with 3 to 5 very prominent obtuse longitudinal nerves or ribs on each side. Panicle and flowers apparently the same as in *C. parviflora,* but the flowers in bud only, and in that state scarcely 2 lines long.

S. Australia. Victoria Springs, Central Australia, *Young,* a single specimen in Herb. F. Mueller. F. Mueller describes the perianth-segments as spirally twisted after flowering, and not articulate on the pedicel, which however is not shown on the specimen, which is only in young bud.

4. **C. setifera,** *Baker in Journ. Linn.* Soc. xv. 359.—Fibres thickened

into spindle-shaped tubers. Tufts of leaves surrounded by long filaments, the remains of old leaf-sheaths. Leaves very narrow and shorter than in *C. parviflora.* Stems simple or branched, slender, attaining 1 ft. or more. Flowers and all other characters precisely those of *C. parviflora.*

N. Australia. Port Darwin, *Schultz, n.* 638.

26. CHAMÆSCILLA, F. Muell.

Perianth spirally twisted over the ovary after flowering but at length deciduous, of 6 oblong spreading 3-nerved nearly equal segments. Stamens 6, hypogynous, shorter than the segments; filaments filiform; anthers small, the cells opening inwards in longitudinal slits. Ovary sessile, 3-celled, with several (rather numerous) ovules in each cell; style filiform, with a terminal capitate stigma. Capsule laterally 3-lobed, the lobes laterally compressed, with an acute dorsal edge. Seeds few in each cell, flattened with acute margins, laterally attached; testa black, crustaceous, smooth and shining. Glabrous perennials, with fibrous roots often thickened into tubers. Leaves radical, grass-like. Scapes leafless, bearing a dichotomous corymb or thyrsoid panicle of blue flowers. Pedicels solitary within scarious bracts.

The genus is limited to Australia, showing the perianth of *Cæsia*, with the fruit and seeds of *Chlorophyton.*

Inflorescence loosely corymbose. Perianth about 4 lines long 1. *C. corymbosa.*
Inflorescence compact, almost thyrsoid. Perianth about 5 lines long . . . . 2. *C. spiralis.*

1. **C. corymbosa,** *F. Muell. Fragm.* vii. 68.—Fibres of the roots more or less thickened into tubers. Leaves often densely tufted, but not usually surrounded by the filamentous remains of old sheaths; linear and grass-like, often small and narrow, but sometimes above 6 in. long and 6 to 8 lines broad, mostly contracted into a petiole; which is again shortly dilated at the base into a scarious sheath. Scapes varying from about 2 in. with only 1 or 2 flowers, to above 6 in. and bearing a loose dichotomous corymb of numerous blue flowers. Pedicels 2 to 6 lines long. Perianth-segments oblong, about 4 lines long. Capsule obovoid, truncate at the top, 3 to 5 lines long, the 3 laterally compressed angles or lobes very prominent.—*Cæsia corymbosa*, R. Br. Prod. 277; Hook. f. Fl. Tasm. ii. 52, t. 132; Baker in Journ. Linn. Soc. xv. 360; *C. versicolor*, Lindl. Swan Riv. App. 57; Endl. in Pl. Preiss. ii. 34.

Victoria. Wendu Vale, *Robertson;* Port Phillip, *Gunn;* and thence to the Grampians and Wimmera, *F. Mueller, Dallachy*, and others.

Tasmania. Abundant in grassy places throughout the island, *J. D. Hooker.*

S. Australia. Round St. Vincent's and Spencer's Gulfs, *F. Mueller* and others.

W. Australia. King George's Sound, *Menzies;* and thence to Swan River, *Drummond, 1st coll. and n.* 804, *Oldfield, Preiss, n.* 1545, and others.

2. **C. spiralis,** *F. Muell. Fragm.* vii. 68.—Very near the *C. corymbosa*, and perhaps a variety only. Radical leaves not numerous, often

surrounded by long filaments the remains of old leaf-sheaths, linear or almost linear-spathulate, 1 to 2 in. long in our specimens, contracted into a petiole, with scarious sheathing bases at least 1 in. long. Scapes under 1 ft. high, straight or flexuose, terminating in a small panicle much more compact and thyrsoid than in *C. corymbosa*, the lower branches bearing 2 or 3 flowers, the uppermost only single ones. Pedicels filiform. Perianth-segments about 5 lines long. Anthers shortly oblong, recurved after shedding the pollen. Ovules rather numerous in each cell. Capsule not seen ripe, but apparently smaller than in *C. corymbosa*, with seeds similarly flattened.—*Cæsia spiralis*, Endl. in Pl. Preiss. ii. 34; Baker in Journ. Linn. Soc. xv. 359.

W. Australia. *Drummond, n.* 805; Princess Royal Harbour, *Preiss, n.* 1543 Stirling Range, *F. Mueller;* Bremer Bay, *Maxwell.*

Cæsia paradoxa, Endl. in Pl. Preiss. ii. 34; Baker in Journ. Linn. Soc. xv. 361, may be a starved specimen of the same species, and at any rate is not otherwise determinable.

27. CORYNOTHECA, F. Muell.

Perianth spirally twisted over the ovary after flowering but at length deciduous, of 6 spreading segments, all nearly equal in length, the inner ones rather broader. Stamens 6, attached to the base of the perianth and shorter than the segments, the 3 opposite the inner segments longer than the 3 others; filaments filiform, glabrous; anthers ovate or oblong, usually shorter than the filaments, the cells opening inwards in longitudinal slits. Ovary 3-celled, with 2 or sometimes only 1 ovule in each cell, and all except 1 constantly abortive; style filiform, with a terminal stigma. Fruit a single ovoid indehiscent 1-seeded nutlet. Seed obovoid, erect or pendulous, the funicle shortly expanded into a black strophiole; testa black, crustaceous, minutely granulated but often shining.—Slender rigid much-branched herbs, leafless except a few radical narrow leaves early withering away, and scarious scales under the branches. Flowers minute, solitary or rarely 2 together within minute bracts along the smaller branches.

The genus is limited to Australia.

Branches elongated, divaricate, dichotomous, or clustered 2 or 3 together	1. *C. lateriflora.*
Branches filiform, flexuose, or very intricately dichotomous	2. *C. dichotoma.*
Stems erect, with numerous short slender acerose often forked pungent branches	3. *C. acanthoclada.*

1. **C. lateriflora,** *F. Muell. Fragm.* vii. 68.—Stems rigid but not thick, with numerous branches, dichotomous or clustered 2 or 3 together, elongated and divaricate. Leaves very rarely seen at the base of the stem, very narrow almost subulate, and only two or three in. long, those of the stem reduced to scarious scales under the branches, or the lower ones sometimes produced into a subulate point of ½ to 1 in. Flowers whitish, solitary or rarely 2 together along the branches, on very short pedicels within a minute scarious bract. Perianth 1½ to nearly 2 lines

long. Anthers oblong but usually shorter than the filament. Fruit an obovoid nutlet, little more than 1 line long, the abortive cells forming a protuberance along one side.—*Cæsia lateriflora*, R. Br. Prod. 277; Baker in Journ. Linn. Soc. xv. 360.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; shores of the gulf, *F. Mueller*; Curlew River, N.W. coast, *A. Cunningham.*

N. S. Wales. In the interior, *Mitchell;* sand ridges on the Murray, near Mount Dispersion, *F. Mueller.*

W. Australia. Sandy shores of Murchison River, *Oldfield.*

2. **C. dichotoma,** *F. Muell. Fragm.* vii. 68.—Stems rigid, filiform or rather stout, very much branched, the flexuose or dichotomous branches often very intricate. Leaves not seen, the scales under the branches very minute or none. Flowers distant along the straighter filiform branchlets or more frequently at the outer angle of the zigzag flexuose branches. Perianth rather above 1 line long, on a shorter pedicel. Nutlet clavate as in *C. acanthoclada*, but contracted at the base into a rather longer stipes.—*Cæsia dichotoma*, F. Muell. Fragm. i. 215; Baker in Journ. Linn. Soc. xv. 360; *Asparagus micranthus*, Lindl. Swan. Riv. App. 58; *Thysanotus micranthus*, Endl. in Pl. Preiss. ii. 36; *Anthericum flexuosum*, R. Br. Herb.

W. Australia. Doubtful Island Bay, *R. Brown*; Swan River, *Drummond*, *1st coll.*, *Preiss*, *n.* 1566 and 1576, and others: Blackwood River, *Forrest* and others: Murchison River, *Oldfield.*

3. **C. acanthoclada,** *F. Muell. Fragm.* vi. 68.—Stems slender but rigid, forming dense erect tufts of 6 in. to 1 ft., with numerous short acerose pungent branches, most of them again forked or slightly branched, but rarely above 1 in. long. Radical leaves few and early withering, leaving only the remains of their scarious sheaths on our specimens, those on the stem all reduced to small scarious scales. Flowers few, scattered along the lateral branchlets, reflexed, on very short pedicels, solitary or rarely 2 together within a minute bract. Perianth scarcely 1 line long. Anthers ovate, much shorter than in *C. lateriflora.* Nutlet clavate, about 1 line long. Seed rather more distinctly granulate than in *C. lateriflora.*—*Cæsia acanthoclada*, F. Muell. Fragm. i. 215; Baker in Journ. Linn. Soc. xv. 360.

W. Australia. Limestone Hills, Murchison River, *Oldfield.*

28. TRICORYNE, R. Br.

Perianth spirally twisted over the ovary after flowering but at length deciduous, of 6 narrow 3- or 5-nerved segments, all entire and equal or the inner ones rather narrower. Stamens 6, hypogynous, shorter than the perianth; filaments filiform, with a dense woolly tuft under the anther; anthers narrow-oblong, erect, emarginate at the base, the cells opening inwards in longitudinal slits. Ovary sessile, deeply 3-lobed and

3-celled, with 2 erect ovules in each cell or lobe; style filiform, undivided. Fruit divided to the base into 3 (reduced sometimes by abortion to 2 or 1) 1-seeded indehiscent nutlets, dry or slightly fleshy, strongly reticulate or ribbed. Seed black with a crustaceous testa and fleshy albumen.—Perennials with fibrous roots. Stems usually wiry and branching, the branches often clustered. Leaves few and grass-like, or all reduced to scarious scales; more rarely small and more leafy plants. Flowers in terminal umbels with small imbricate scarious bracts, of which one or two outer empty ones often elongated or leaf-like.

The genus is limited to Australia.

Stems wiry or rush-like, branched and without leaves, except a few at the base, usually 1 to 2 ft. high. Flowers 6, or fewer in the umbel or rarely more.
  Stems bordered by narrow wings . . . . 1. *T. platyptera.*
  Stems usually with clustered branches, deeply striate, acutely angled, or slightly flattened.
    Quite glabrous . . . . 2. *T. anceps.*
    Stem and branches hispid . . . . 3. *T. muricata.*
    Stems less branched, terete, or slightly striate . . 4. *T. elatior.*
Stems simple, under 1 ft., with a single many-flowered umbel, and rather long radical leaves. Eastern species . 5. *T. simplex.*
Stems under 6 in., branched and leafy, with several many-flowered umbels. Western species . . . . 6. *T. humilis.*

1. **T. platyptera,** *Reichb. f. Beitr. Syst. Pfllanzenk.* 72.—Very near *T. anceps* and more deserving of that name, but as far as the specimens show apparently distinct. Stems from a shortly creeping base erect or ascending, sparingly branched, 1 to nearly 2 ft. high, the branches flattened with the margins more or less winged, the total breadth varying from 1 to 3 lines. Leaves very few at the base of the stem and rarely 1 in. long, those under the branches rigid, erect, under ½ in. or all reduced to very small scales. Umbels of several, often more than 6, flowers. Perianth-segments 4 to 5 lines long, the pedicels nearly as long. Bracts under the pedicels all very small. Nutlets obliquely ovoid, nearly two lines long, strongly ribbed when dry, contracted at the base into a short thick stipes.—*T. pterocaulon*, Baker in Journ. Linn. Soc. xv. 368.

Queensland. Sandy shores, Cape York, *Veitch, Daemel;* Fitzroy Island, *Walter;* Dunk Island, *M'Gillivray;* Cleveland Bay, *Bowman;* Port Denison, *Hecate Expedition;* gathered also in *Hann's Expedition*, and by Frau Dietrich. I have not seen her specimens, but Reichenbach's character is quite sufficient to identify the species.

2. **T. anceps,** *R. Br. Prod.* 278.—Stems erect, slender but rigid and very much branched, the branches often densely clustered, the principal ones prominently striate, but terete or slightly compressed, the numerous smaller ones flattened or acutely 3- or 4-angled but not distinctly winged. Leaves in all the specimens seen reduced to small scales. Umbels of 3 to 6 flowers, with very small bracts. Perianth-segments about 4 lines long, the pedicels shorter. Nutlets as large as in *T. pterocaulon* but smooth.—Baker in Journ. Linn. Soc. xv. 368.

Queensland. Sandy shores, Endeavour River, *Banks and Solander*, *A. Cunningham;* Rockingham Bay, *Dallachy.*

3. **T. muricata,** *Baker in Journ. Linn. Soc.* xv. 363.—Stems erect, rigid, with numerous slender strongly striate or angular branches as in *T. anceps*, but the angles hispid with small rigid transparent hairs. Leaves reduced to scales, umbels and flowers of *T. anceps*, of which this may prove to be a hispid variety.

Queensland. Wide Bay, *Bidwell.*

4. **T. elatior,** *R. Br. Prod.* 278.—Stems from a perennial sometimes thick and woody rhizome erect or ascending, more or less branched, often under 1 ft. but sometimes above 2 feet high, the branches few or numerous, but rarely more than 3 in a cluster, slender or even filiform especially in the western specimens, striate but less so than in *T. anceps*. Lower leaves often grass-like, 2 to 4 in. long, the upper ones and sometimes all reduced to short scales. Umbels usually 3- or 4-flowered in the eastern specimens, with 6 or more flowers in most of the western ones, the scarious bracts usually prominent and 1 or 2 outer ones often produced into subulate points of 3 or 4 lines. Perianth very variable in size, but usually about 4 lines long. Nutlets smaller than in *T. anceps.*—Baker in Journ. Linn. Soc. xv. 362; Bauer, Illustr. Pl. Nov. Holl. t. 11; Endl. Iconogr. t. 61; Endl. in Pl. Preiss. ii. 35; Hook. f. Fl. Tasm. ii. 55; *T. anceps*, Endl. l.c. 36, not of R. Br.

Queensland. Moreton Island, *M'Gillivray*, *Eaves;* Condamine River, *Leichhardt;* Peak Downs, *F. Mueller;* Armidale, *Perrott;* Rockhampton, *O'Shanesy;* Port Curtis, *M'Gillivray.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and others; northward to New England, *C. Stuart;* Hastings River, *Beckler;* southward to Illawarra, *A. Cunningham;* and in the interior, Darling River to Cooper's Creek, *Victorian and other Expeditions.*

Victoria. Common on the Glenelg, the Yarra, etc., and in the Grampians, *Robertson*, *F. Mueller*, and others.

Tasmania. South Esk River, *Gunn* and others; Cheshunt, *Archer.* In these Tasmanian specimens the flowers are usually more numerous in the umbels than in those from N. S. Wales, less so than in the western specimens.

S. Australia. St. Vincent's Gulf, *F. Mueller* and others: Port Lincoln, *R. Brown*, *Wilhelmi.*

W. Australia. King George's Sound, *R. Brown*, *A. Cunningham*, *F. Mueller*, and others; and thence to Swan and Murchison Rivers, *Drummond*, *Preiss*, *n.* 1715 and 2227? *Oldfield* and others; eastward to Cape Arid, *Maxwell.*

T. scabra, R. Br. Prod. 278, from Keppel Bay, appears to be a common form of *T. elatior*, but with a few minute hairs scattered on the lower part of the stem, very different from the hispid *T. muricata.*

T. tenella, R. Br. l. c., Baker in Journ. Linn: Soc. xv. 362, from Port Lincoln, is a very slender dwarf branching form, which I cannot otherwise distinguish from *T. elatior.*

5. **T. simplex,** *R. Br. Prod.* 278.—Stems simple or very rarely once-branched, 6 in. to 1 ft. high, with a few grass-like leaves sometimes as long as the stem. Umbel solitary, terminal, with very numerous flowers (usually above 20), the pedicels longer than the perianth. Bracts all

scarious or rarely 1 or 2 outer ones with fine points. Perianth-segments about 5 lines long.—Baker in Journ. Linn. Soc. xv. 362.

Queensland. Moreton Bay, *Herb. F. Mueller* (collector not named).
N. S. Wales. Port Jackson, *R. Brown*, *Vicary*, *J. D. Hooker*, *United States Exploring Expedition.*

6. **T. humilis,** *Endl. in Pl. Preiss.* ii. 36.—Stems under 6 in. high, shortly branched and very leafy above the base, the grass-like leaves rather broad, and many of them exceeding the flowers. Umbels terminating axillary branches shorter than the leaves, and all many-flowered; 2 or 3 of the outer bracts leaf-like and as long as or longer than the flowers. Perianth-segments about 5 lines long, the filiform pedicels longer.—Baker in Journ. Linn. Soc. xv. 362.

W. Australia. Hay District, *Preiss*, *n.* 1605; sands of Vasse River, *Oldfield;* Lake Muir, *Muir.*

29. STYPANDRA, R. Br.

Perianth withering after flowering but not twisted, and at length deciduous, of 6 spreading segments usually 5-nerved, all equal and entire or the inner ones broader. Stamens 6, hypogynous, much shorter than the perianth; filaments either filiform and flexuose at the base with a dense woolly tuft under the anther, or shortly tomentose-woolly from the base; anthers oblong, very much rolled back after shedding the pollen. Ovary sessile, 3-celled, with several ovules in each cell; style filiform, undivided. Capsule ovoid or oblong, 3-valved. Seeds several (3 to 6) in each cell, ovate, more or less flattened, with a black smooth crustaceous testa, opaque or shining.—Perennials with fibrous roots. Stems erect or ascending, simple below the inflorescence or branched and sometimes woody at the base. Leaves either all radical or distichously spreading on the stem. Flowers blue, in a very loose terminal dichotomous cyme. Pedicels filiform, often 2 or 3 together and terminal or solitary along the branches. Bracts minute or none, or the lower ones leaf-like in the leafy species.

The genus is limited to Australia.

Stems leafy to the inflorescence, often branched at the base and sometimes woody . . . . 1. *S. glauca.*
Stems leafless except at the base. Leaves linear, in dense radical tufts.
  Leaves very rigid, 1½ to 3 lines broad. Flowers blue or yellowish, very rarely white . . . . 2. *S. cæspitosa.*
  Leaves slender, 1 to 1½ lines, or rarely broader. Flowers usually white . . . . 3. *S. umbellata.*

1. **S. glauca,** *R. Br. Prod.* 279.—A leafy perennial with stems on a creeping rhizome sometimes low and tufted, or weak and ascending, under 1 ft. high, sometimes 2 or 3 ft. high, woody and branched at the base. Leaves distichous, the sheaths usually concealing the stem, somewhat flattened with an acute keel, or almost terete, the blade erect or

spreading, linear or lanceolate, usually 3 to 4 in. long, but sometimes twice that length and varying from 2 to 4 lines in breadth. Flowers in a loose terminal dichotomous cyme usually leafy at the base, the branches very spreading, the filiform pedicels recurved, varying from ½ to 1 in. long, mostly solitary but sometimes 2 together at the ends of the branches, without subtending bracts except sometimes a leafy one under the lowest. Perianth blue, often turning red in drying, the segments very acute, 5-nerved, about 6 lines long. Stamens very much shorter; filaments filiform and twisted in the lower half, with a dense oblong tow-like tuft of hairs under the anther; anther shorter than the filament, much recurved, almost spiral after shedding the pollen. Capsule oblong, 3 to 4 lines long. Seeds several in each cell, rather less flattened than in *S. cæspitosa*, smooth but not shining.—Baker in Journ. Linn. Soc. xv. 356; F. Muell. Fragm. vii. 64; *S. propinqua*, A. Cunn. in Bot. Mag. t. 3417; *S. frutescens*, Knowl. and Westc. Fl. Cab. ii. 61, 69, t. 63; *S. virgata*, Endl. in Pl. Preiss. ii. 35.

Queensland. Darling Downs, *Law.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, *n.* 202, and others; in the interior to Lachlan River, *A. Cunningham;* Liverpool Plains, *C. Moore;* New England, *C. Stuart.*

Victoria. From the Grampians, *Wilhelmi*, *F. Mueller*, and others; to Eastern Gipps' Land, *Walter.*

W. Australia. King George's Sound, *R. Brown* and others; to Swan and Murchison Rivers, *Drummond*, *Oldfield*, *Preiss*, *n.* 1549, and others.

S. grandiflora, Lindl. Swan Riv. App. 57, from Swan River, *Drummond*, 1*st coll. and n.* 781, is a luxuriant variety, with the perianth 8 or 9 lines long.

S. scoparia, Endl. in Pl. Preiss. ii. 35, from W. Australia, Preiss, n. 1550, found also on Mount Sturgeon in Victoria, *Robertson*, is a variety or perhaps only an old state with very numerous short lateral branches and densely tufted narrow leaves.

S. imbricata, R. Br. Prod. 279, from King George's Sound and Lucky Bay, *R. Brown* and others; and eastward to Cape Legrand, *Maxwell*, is a variety with narrow crowded leaves, which however passes gradually into the common form.

2. **S. cæspitosa,** *R. Br. Prod.* 279.—Stems from a thick horizontal rhizome erect, 1 to 2 feet high, simple below the inflorescence. Leaves mostly radical, with very short distichous sheaths, erect, rigid, 6 in. to 1 ft. long and 1½ to 3 lines broad. Scapes leafless or occasionally with 1 or 2 short leaves with long sheaths. Inflorescence loosely dichotomous and occupying at least half the total height of the plant. Pedicels erect, filiform but rigid, 1 to 2 in. long, usually 3 or 4 together in an umbel at the end of each branch. Bracts linear-lanceolate and almost leafy under the principal branches, very small under the smaller branches and pedicels. Perianth erect, blue or yellowish inside or very rarely white, the segments 5 to 6 lines long, narrower and less acute than in *S. glauca*. Stamens about half as long as the segments, the filaments densely covered with very short cottony hairs almost from the base. Capsule oblong, about 3 lines long. Seeds several in each cell, rather flat, smooth and shining.—Baker in Journ. Linn. Soc. xv. 355; Hook. f. Fl. Tasm. ii. 55; F. Muell. Fragm. vii. 65.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Sieber, n.* 201, *A. Cunningham*, and others; northward to New England, *C. Stuart;* Newcastle, *Leichhardt;* Mount Mitchell, *Beckler;* in the S.W. interior, *Fraser, M'Arthur.*

Victoria. From Dandenong and the Upper Yarra to Gipps' Land, *F. Mueller* and others.

Tasmania. Near Georgetown, abundant, *Gunn.*

8. **S. umbellata,** *R. Br. Prod.* 279.—Very near *S. cæspitosa*, and considered by F. Mueller (Fragm. vii. 65) as a variety only, smaller in every respect and very densely tufted. Radical leaves numerous, mostly 5 to 8 in. long and only 1 to 2 lines broad, not so rigid as in *S. cæspitosa.* Stems including the inflorescence 8 to 10 in. high, the inflorescence much less branched than in that species, and often reduced to a single umbel of 2 to 4 flowers on a simple scape. Perianth-segments about 5 lines long, white or yellowish. Capsule and seeds of *S. cæspitosa.*—Baker in Journ. Linn. Soc. xv. 356; Hook. f. Fl. Tasm. ii. 55.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Sieber, n.* 200, and others.

Victoria. Wendu Vale, *Robertson;* Mount William, *Wilhelmi;* Latrobe River, *F. Mueller.*

Tasmania. Abundant in sandy soil throughout the island, *J. D. Hooker.*

Var. *Fraseri*, Baker. Leaves and scapes filiform. Flowers few, the perianth-segments narrow and only 3 to 4 lines long. Flowers pure white.

N. S. Wales. Peat swamps near Sydney, rare, *Fraser*, also gathered probably in the interior by *Mitchell.*

80. ARTHROPODIUM, R. Br.

Perianth persistent but not twisted, of 6 spreading segments, nearly equal in length, but the inner ones broader, and often crisped or shortly fringed on the edges. Stamens 6, attached to the base of the segments or almost hypogynous, shorter than the perianth; filaments shortly filiform, with a dense tuft of woolly hairs or a papillose appendage in their upper part or occupying nearly the whole filament; anthers linear, erect, the cells opening inwards in longitudinal slits. Ovary sessile, 3-celled, with several ovules in each cell; style filiform, with a terminal stigma. Capsule 3-valved. Seeds usually few, black, angular, the testa smooth or minutely granular, not shining.—Tufted perennials, with the fibres often thickened into tubers. Leaves radical or crowded at the base of the stem, linear and grass-like, with scarious sheathing bases. Stems simple or with few elongated branches, leafless or with only 1 or 2 short distant leaves below the inflorescence. Flowers loosely racemose, the filiform pedicels solitary or few together within a scariose bract, and when several accompanied by very small bracteoles within the bract.

Besides the Australian species, which are all endemic, there are two from New Zealand, and one New Caledonian species.

Anthers shorter than the filaments, recurved after shedding the pollen; filaments with woolly-hairy appendages. Eastern species.
  Flowers usually 2 or 3 to each bract. Filaments woolly-hairy only above the middle . . . . 1. *A. paniculatum*.
  Flowers usually solitary, small. Filaments shortly woolly-hairy from near the base . . . . 2. *A. minus*.
Anthers as long as or longer than the filaments, not recurved; filaments with papillose or very shortly hairy appendages. Western species.
  Inflorescence divaricately branched. Perianth 3 to 4 lines long . . . . 3. *A. capillipes*.
  Inflorescence simple or with few long branches. Perianth about 5 lines long.
    Leaves grass-like, 1½ to 2 lines broad. Western species . . . . 4. *A. Preissii*.
    Leaves subulate, or if flat ½ line broad. Eastern species. . . . . 5. *A. dianellaceum*.

1. **A. paniculatum,** *R. Br. Prod.* 276.—Fibrous roots thickened into tubers, but only at a distance from the stock. Stems erect, 1 to 2 feet high, usually divided above the middle into a few long slender spreading flowering branches. Leaves narrow, crowded at the base of the stems, from 2 or 3 in. to nearly 1 foot long, with broad scarious sheathing bases, and occasionally a smaller leaf on the stem below the inflorescence. Flowers white or purplish, 2 to 4 together along the branches on filiform pedicels from 2 or 3 lines to above 1 inch long, in the axils of minute bracts. Perianth-segments 3 or rarely 4 lines long, the inner ones much broader than the outer, and often but not always denticulate or almost fringed on the margin. Filaments with a dense tuft of woolly hairs only above their middle.—Baker in Journ. Linn. Soc. xv. 352; Hook. f. Fl. Tasm. ii. 50; F. Muell. Fragm. vii. 66; *Anthericum paniculatum*, Andr. Bot. Rep. t. 395; *Phalangium paniculatum*, Poir. Dict. Suppl. iv. 388; *Anthericum milleflorum*, Red. Lil. t. 58; *Phalangium pendulum*, Red. Lil. t. 360 (?), Bot. Mag. t. 1421, Endl. Iconogr. t. 28; *Anthericum pendulum*, Hornem.; Willd. Enum. Hort. Berol. 371; *Arthropodium pendulum*, DC.; Kunth, Enum. iv. 620, Baker in Journ. Linn. Soc. xv. 353; *A. minus*, Lindl. Bot. Reg. t. 866; *A. Lindleyi*, Kunth, l. c. 621.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls*, and others; New England, *C. Stuart*.

Victoria. From the Upper Yarra to Gipps' Land, *F. Mueller*, *Walter*, and others.

Tasmania. Port Dalyrmple, *R. Brown*; abundant throughout the island, *J. D. Hooker*.

S. Australia. Mount Gambier, *F. Mueller* and others.

Redouté's figure of his *Phalangium pendulum* differs from all the specimens I have seen, including those since cultivated in the Paris garden under his name, in having the inner segments not broader than the outer ones. What is generally considered as his plant only differs from the typical *A. paniculatum* in the shorter pedicels.

2. **A. minus,** *R. Br. Prod.* 276.—Roots a fascicle of oblong tubers close to the stock. Stems slender, from under 6 in. to 1 ft. or rather

more, simple or rarely with one branch. Leaves radical, much shorter than the stem, varying from 1 to 3 lines broad. Flowers solitary within each bract or very rarely 2 together, usually smaller than in *A. paniculatum*, the perianth-segments 2½ to 3 lines long. Filaments longer than the anther, the woolly hairs extending over the greater part of their length.—Baker in Journ. Linn. Soc. xv. 353; Hook. f. Fl. Tasm. ii. 51.

N. S. Wales. Port Jackson, *R. Brown* and others; New England, *C. Stuart;* Nangas, *M'Arthur.*

Victoria. From the Glenelg and Port Phillip to the Grampians, *Robertson, F. Mueller*, and many others; Wimmera, *Dallachy.*

Tasmania. Rich pasture land in the northern parts of the island, *Gunn.*

3. **A. capillipes,** *Endl. in Pl. Preiss.* ii. 34.—Roots apparently all fibrous and not thickened into tubers. Radical leaves narrow but mostly withered away from the flowering specimens. Stems 1 to 2 ft. high, divaricately branched, with occasionally a filiform leaf under the lowest branches. Pedicels solitary within each bract, filiform, divaricate, 1 in. long or more. Perianth-segments 3 to 4 lines long. Filaments with tufts of dense papillæ or very short hairs extending some way down from the anther and ending in 2 short lobes, thus connecting this species with the genus *Dichopogon.*

W. Australia. Swan River, *Preiss, n.* 1555, and apparently also an imperfect specimen, *Drummond;* Port Gregory, *Oldfield;* south coast, *Maxwell, Miss Sewell.* Baker in Journ. Linn. Soc. xv. 353, refers this to the eastern *A. paniculatum,* from which it appears to me to differ in the roots, inflorescence, and stamens.

4. **A. Preissii,** *Endl. in Pl. Preiss.* ii. 35.—Roots apparently fibrous without tubers. Radical leaves densely tufted, grass-like, mostly 1½ to 2 lines broad, surrounded by numerous filaments the residue of old leaf-sheaths. Stems 1 to 2 ft. high, with a few long branches or sometimes quite simple. Pedicels solitary or 2 or 3 together within each bract, ½ to 1 in. long, usually reflexed, the bracts very small. Perianth-segments narrow, about 5 lines long. Filaments thickened and papillose in the upper half but scarcely hairy; anthers linear, as long as or longer than the filament. Capsule recurved.—Baker in Journ. Linn. Soc. xv. 353.

W. Australia. Swan River, *Preiss, n.* 1567, *Drummond, n.* 806; Port Gregory, *Oldfield;* Blackwood River, *Forrest;* Salt River, *Maxwell.*

5. **A. dianellaceum,** *F. Muell. Fragm.* x. 65.—Fibrous roots more or less thickened into tubers. Radical leaves few, subulate or when flat not above ½ line broad, very shortly dilated into sheaths and not split into filaments. Stems very slender, 1 to 1½ feet high, with few filiform branches. Pedicels solitary, recurved, filiform, ½ to ¾ in. long. Bracts very small. Perianth-segments narrow, about 5 lines long. Filaments short, papillose-hairy in the upper half; anthers linear, at least twice as long as the filament.

Queensland. Brisbane River, *Bailey.*

31. DICHOPOGON, Kunth.

Perianth persistent but not twisted, of 6 spreading segments, nearly equal in length, but the inner ones much broader and sometimes slightly crisped or fringed on the edges. Stamens 6, attached to the base of the perianth or almost hypogynous, shorter than the segments; filaments short, flattened at the base, not bearded; anthers longer, erect, linear, with 2 small crest-like appendages at the base reflexed on the filament (and sometimes shortly adnate to it ?); the cells opening inwards in longitudinal slits. Ovary sessile, 3-celled, with several ovules in each cell superposed in 2 rows; style filiform, with a terminal stigma. Capsule globular, 3-valved. Seeds several, angular, black, the testa smooth or granular, not shining.—Tufted perennials, with the fibrous roots often thickened into tubers. Leaves radical, grass-like, with scarious sheathing bases. Stems simple or with a few long branches, leafless or with a short leaf under the lowest branch. Flowers purple lilac or rarely blue, in a long simple raceme at the end of each branch, solitary or 2 or 3 together within distant scarious bracts, the pedicels articulate at or above the middle.

The genus is limited to Australia. It was formerly included in *Arthropodium*, and may perhaps still be considered as a section only, distinguished by Kunth as having the appendages to the stamens attached to the anthers and not to the filament.

Capsules erect. Anther-appendages very short . . . . . 1. *D. strictus*.
Capsules reflexed. Anther-appendages rather long . . . . 2. *D. Sieberianus*.

1. **D. strictus,** *Baker in Journ. Linn. Soc.* xv. 319, *excl. syn.*—Radical leaves narrow-linear, varying in length from 3 or 4 in. to twice as much, always shorter than the stems, the older tufts often surrounded by numerous long filaments, the remains of old leaf-sheaths. Stems from under 1 ft. to above 2 ft. high, the scarious bracts under the branches and pedicels sometimes very narrow and small, sometimes broadly scarious, 3 lines long, besides a more or less lengthened terminal point. Flowers solitary or in clusters of 2 or 3 within each bract, and when more than one accompanied by small bracteoles within the bract, the clusters distant along the rhachis. Pedicels erect spreading or recurved, shorter or longer than the flowers. Perianth-segments usually 5 to 6 lines long, 3-nerved in the centre. Appendages to the base of the anthers usually short and crest-like. Fruiting pedicels erect or spreading, the capsule always erect.—*Arthropodium strictum*, R. Br. Prod. 276; F. Muell. Fragm. vii. 66; *A. laxum*, Hook f. Fl. Tasm. ii. 51, t. 131, not of Sieb.; *Dichopogon humilis*, Kunth, Enum. iv. 623, and probably also *D. setosus*, Kunth, l. c. 624; *D. undulatum*, Reg. Gartenfl. ii. 1, t. 37.

Queensland. Moreton Bay, *Fitzalan;* Darling Downs, *Leichhardt;* Rockhampton ? *Bowman.*

N. S. Wales. Paramatta, *Woolls;* Bathurst Plains, *A. Cunningham;* Nangas, *M'Arthur;* Goyinga Mountains, *Victorian Expedition.*

Victoria. From the Glenelg River and Port Phillip to the Murray, *Robertson, F. Mueller,* and many others.

Tasmania. Port Dalyrmple, *R. Brown*; abundant in good soil throughout the island, *J. D. Hooker*.

S. Australia. Round St. Vincent's Gulf, *F. Mueller*; Yorke Peninsula, *Fowler*.

This species varies very much in stature, in the size and shape of the scarious bracts, in the flowers all solitary or all in clusters of 2 or 3, erect or pendulous, in the size of the perianth and length of the pedicels, but I have been unable to sort into distinct varieties the very numerous specimens I have had before me.

2. **D. Sieberianus,** *Kunth, Enum.* iv. 628.—Habit of the slender narrow-leaved specimens of *D. strictus*. Stems mostly about 1 ft. high, simple or slightly branched. Leaves very narrow. Flowers in clusters of 2 or 3 like those of *D. strictus*, but the pedicels reflexed from near the base. Appendages to the base of the anthers rather long and almost adnate to the filament. Capsules always reflexed.—*Arthropodium laxum*, Sieb. in Rœm. et Schult. Syst. vii. 441.

N. S. Wales. Port Jackson or Blue Mountains, *Sieber, n.* 194, *Vicary*; New England, *C. Stuart*; Head of the Gwydir, *Leichhardt*; Richmond, *Backhouse*.

Victoria. Wendu Vale, *Robertson*.

S. Australia. St. Vincent's Gulf and Murray Desert, *F. Mueller*.

The *Arthropodium fimbriatum*, R. Br. Prod. 276, of which no specimen is preserved in his herbarium, is probably this species, and possibly also the plant raised by Salisbury, for which he proposes (Gen. Pl. 67) the generic name *Siona*.

Baker, in Journ. Linn. Soc. xv. 319, distinguished the two species as *D. humilis* and *D. strictus*, chiefly by the pedicels usually solitary and ascending in the former, deflected and two or three together in the latter; but the very numerous and varied specimens since seen show that neither of these characters are at all constant, and the plant R. Brown had in view appears to me to be referable to the common form, and not to the closely allied species gathered by Sieber.

32. CHLOROPHYTON, Ker.

Perianth persistent, not twisted, of 6 distinct oblong or narrow 3-, 5-, or 7-nerved segments, the inner ones usually rather broader. Stamens 6, all hypogynous or those opposite the inner segments attached to their base, shorter than the perianth; filaments filiform or slightly compressed, glabrous; anthers oblong or linear, shorter than the filaments, the cells opening inwards in longitudinal slits. Ovary sessile, 3-celled, with several (4 to 20) ovules in each cell superposed in 2 rows or very rarely reduced to 2 collateral ones; style filiform, with a terminal stigma. Capsule laterally 3-lobed, the lobes usually laterally compressed with an acute dorsal edge, 3-valved. Seeds few, sometimes only 1 in each cell, flattened with acute margins, laterally attached, the hilum more or less intruded; testa black, usually shining.—Perennials with fibrous roots often thickened into tubers. Leaves grass-like, radical or crowded at the base of the stem. Scapes simple or slightly branched. Flowers solitary or 2 or 3 together within scarious bracts, the clusters sessile along the scape in a terminal raceme.

There are a considerable number of species spread over the warmer regions of Asia and Africa. Of the two Australian ones, one has a wide range in tropical Asia, the other is endemic and extratropical.

Ovules usually more than 2 in each cell. Fruiting pedicel longer than the capsule. Tropical species	1. *C. laxum.*
Ovules 2 in each cell. Fruiting pedicel shorter than the capsule. Tasmanian species	2. *C. alpinum.*

1. **C. laxum,** *R. Br. Prod.* 277.—Root fibres more or less thickened into tubers. Leaves varying from a foot long or even more and scarcely above 1 line broad, to only a few inches long and 2 to 3 lines broad, erect or spreading, usually long and narrow in the Australian species. Scape shorter than the leaves, simple or once branched near the base, with few distant clusters of 2 or 3 flowers each, or sometimes only 1 flower within the scarious bract, often accompanied by 2 or more smaller scarious bracts or bracteoles within the outer one. Pedicels rather rigid, about 1 line long at the time of flowering but often 3 lines or more when in fruit. Perianth-segments narrow, scarcely 1½ lines long in the Australian and common Asiatic form, larger in some African specimens. Capsule nearly 3 lines broad but not so long, truncate at the top, with 2 to 6 seeds in each lobe or cell.—Baker in Journ. Linn. Soc. xv. 328, with the numerous synonyms there adduced; *C. xerotinum*, F. Muell. Fragm. i. 63; *Phalangium parviflorum*, Wight, Ic. t. 2039; *Phalangium laxum*, F. Muell. Fragm. vii. 71.

N. Australia. Arnhem S. Bay, *R. Brown;* Sea Range, *F. Mueller.* Widely spread over tropical Asia and Africa.

2. **C. alpinum,** *Baker in Journ. Linn. Soc.* xv. 329.—Roots fibrous without tubers in the specimens seen, the plant otherwise closely resembling the small specimens of *C. laxum.* Scapes simple, 1 to 2 in. high. Leaves narrow, the longest 2 or 3 times as long as the scape. Flowers few together in the clusters, on very short pedicels, the perianth-segments 2 to 2½ lines long. Capsule as large as in *C. laxum*, but not seen quite ripe. Ovules only 2 in each cell in the flowers examined. Seeds flat, disk-shaped.—*Cæsia* (?) *alpina*, Hook. f. Fl. Tasm. ii. 378.

Tasmania. Western Mountains, *Archer.*

33. HERPOLIRION, Hook. f.

Perianth (persistent ?) of 6 linear equal segments, erect at the base, spreading from below the middle upwards. Stamens 6, attached to the base of the perianth and shorter than the segments; filaments filiform, anthers linear, erect, the cells opening inwards in longitudinal slits. Ovary sessile short, 3-celled, with several ovules in each cell; style filiform, with a terminal stigma. Fruit apparently capsular.—A dwarf stemless plant with solitary flowers almost sessile within the tufts of leaves.

The genus is limited to the single Australian species, which is also in New Zealand. In habit and inflorescence it differs widely from all other Australian *Liliaceæ*, but might perhaps be compared to *Baxtera.*

1. **H. Novæ-Zelandiæ,** *Hook. f. Fl. Nov. Zel.* i. 258.—Rhizome creeping, sending up numerous tufts of linear leaves, 1 to 2 in. long, their sheathing bases distichous and imbricated. Flowers solitary within the tuft, on an exceedingly short scape or peduncle, on which one or two of the upper or inner leaves are reduced to sheathing bracts shorter than the perianth. Perianth white or bluish, the segments 5-nerved, about ¾ in. long, spreading from a little below the middle. Anthers shorter than the filaments, shortly sagittate at the base. Fruit unknown, but from the slightly enlarged ovary probably capsular.—Baker in Journ. Linn. Soc. xv. 287; *H. Tasmaniæ,* Hook. f. Fl. Nov. Zel. i. 258 and Fl. Tasm. ii. 54, t. 132.

Victoria. Between the Murray and Snowy Rivers and on the Baw Baw Mountains, ascending to 4500 ft., *F. Mueller.*

Tasmania. Summits of the Western Mountains, Lake St. Clair, covering large patches of ground, *Gunn;* Hampshire Hills, *Milligan.*

34. SOWERBÆA, Sm.

Perianth persistent without twisting, of 6 oblong or ovate segments, all free or the inner ones shortly connate at the base. Stamens 3 perfect, opposite the inner segments at their base, with very short filaments, anthers erect divided to below the middle into 2 linear lobes opening laterally in longitudinal slits, the 3 opposite the outer lobes reduced to short filaments without anthers or entirely wanting. Ovary short, 3-celled, with 2 to 6 ovules in each cell. Style filiform, with a terminal stigma. Capsule 3-celled, enclosed in the persistent perianth, opening loculicidally in 3 valves. Seeds few, more or less angular, with a thick but scarcely crustaceous black testa minutely granulated. Embryo small, linear, in the centre of the albumen.—Tufted perennials with fibrous roots. Leaves at the base of the stem linear-filiform. Stems or scapes leafless, simple or rarely branched at the base, with a single terminal globular umbel of pink flowers, and small scarious imbricate bracts at the base of the pedicels.

The genus is limited to Australia.

Perianth-segments about 3 lines long, all free. Staminodia without anthers alternating with the perfect stamens.
  Perianth-segments oval-oblong. Anthers about half their length. Eastern species. . . . . 1. *S. juncea.*
  Perianth-segments narrow-oblong. Anthers reaching to much above their middle. Western species . . . . 2. *S. laxiflora.*
Perianth-segments about 2 lines, the inner ones shortly united at the base. No staminodia. Northern species . . . . 3. *S. alliacea.*

1. **S. juncea,** *Sm. in Trans. Linn. Soc.* v. 160, *t.* 6.—Stems simple, slender, 1 to 2 feet high. Leaves at the base of the stem somewhat distichous, linear-filiform, terete, all short or some nearly as long as the stem, bordered at the base and sometimes up to nearly 2 in. with scarious transparent sheathing margins. Umbel many-flowered, the imbricate bracts either all very short and scarious or 2 or 3 of the outer

ones of a firmer consistence, rather larger and acute. Pedicels at first scarcely exceeding the bracts, lengthening as the flower expands, but rarely longer than the perianth. Perianth pink, the segments oval-oblong; 8 lines long or rather more, all affixed at about the same level. Anther-bearing filaments very short and flattened, alternating with as many nearly similar but without anthers; anthers usually attaining to about half the perianth, divided almost to their cordate base. Seeds usually about 8 in the capsule.—R. Br. Prod. 285; Andr. Bot. Rep. t. 81; Bot. Mag. t. 1104; Red. Lil. t. 841.

Queensland. Moreton Island, *M'Gillivray*, *F. Mueller*.
N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, *n.* 193, and *Fl. Mixt. n.* 521, *A. Cunningham*, and others; northward to Hastings River, *Beckler*; Richmond River, *Henderson*.
Victoria. Gipps' Land, Latrobe River, *F. Mueller*; Cape Howe, *Walter*.

2. **S. laxiflora,** *Lindl. Bot. Reg.* 1841, t. 10.—Very near *S. juncea*, with the same habit inflorescence and narrow grass-like leaves. Stems varying from very slender and under 1 ft. to rather stout and 1½ or 2 ft., and sometimes slightly branched at the base. Leaves crowded at the base of the stem but sometimes extending some way up, the sheaths less prominent than in *S. juncea* and sometimes not at all scarious. Umbels loose, the filiform pedicels often at length much longer than the perianth. Perianth pink, the segments about 8 lines long, much narrower than in *S. juncea*. Anthers reaching to considerably above the middle of the perianth, alternating with staminodia as in *S. juncea*.—F. Muell. Fragm. vii. 87.

W. Australia. King George's Sound to Swan River, *Drummond*, *1st coll. and n.* 782, *Preiss*, *n.* 1552, *F. Mueller*, and many others; Murchison River, *Oldfield*.

8. **S. alliacea,** *F. Muell. Fragm.* vi. 180.—Habit and foliage of the slenderer specimens of *S. juncea*, but with the stem sometimes slightly branched at the base. Inflorescence the same but the flowers much smaller. Perianth only 2 lines long, the segments rather broad, the 8 inner ones united at the base rather higher up the receptacle than the outer ones. Stamens about half the length of the perianth, the three short broad filaments closely contiguous, without any intervening staminodia.

N. Australia. Liverpool River, Arnhem's Land, *Gulliver*.

85. ALANIA, Endl.

Perianth persistent, of 6 equal narrow segments. Stamens 6, hypogynous, nearly as long as the perianth, filaments filiform; anthers small, ovate, the cells opening inwards by longitudinal slits. Ovary sessile, ovoid, 8-celled, with few ovules in each cell; style short, recurved, the stigma almost capitate. Capsule globular, opening loculicidally in 8 valves. Seeds few or only one in each cell, oblong, without any strophiole; testa crustaceous black smooth and shining.—Perennial with diffuse stems, covered by the crowded linear leaves. Flowers in globular umbels on axillary peduncles.

The genus is limited to the single species endemic in Australia.

1. **A. Endlicheri,** *Kunth, Enum.* iv. 644.—Stems elongated in some specimens to above 1 ft., diffuse. Leaves crowded, linear-filiform, acute, 2 to 4 in. long, dilated at the base into brown scarious imbricate sheaths entirely concealing the stem. Peduncles axillary, filiform, shorter or rather longer than the leaves. Spikes forming at first globular heads of 3 to 4 lines diameter with very numerous closely imbricate brown scarious acute or acuminate bracts, 1 or 2 of the lowest often produced into leafy subulate points. As the flowering advances the filiform pedicels, one within each bract, lengthen to 2 or 3 lines, transforming the head into an umbel, the pedicels not articulate. Perianth-segments scarcely above 1 line long, and the capsule not larger.

N. S. Wales. Fissures of rocks, Blue Mountains, *A. and R. Cunningham, Miss Atkinson.*

TRIBE X. JOHNSONIEÆ.—Perianth-segments free or united in a tube at the base. Style filiform with a terminal entire stigma. Stock not bulbous. Flowers in dense heads or short spikes, solitary and sessile or nearly so within imbricate bracts.

36. LAXMANNIA, R. Br.

Perianth withering and persistent but not twisted, of 6 segments, the 3 outer ones distinct from the base, the 3 inner very shortly united at the base or almost free. Stamens 6, shorter than the perianth, 3 opposite the outer segments hypogynous or nearly so, 3 adnate to the middle of the inner segments; filaments filiform; anthers short, 2-lobed at the base, fixed on the back at the base of the lobes, the cells opening inwards in longitudinal slits. Ovary contracted at the base or almost stipitate, 3-celled, with 2 to 4 ovules in each cell; style shortly filiform, with a somewhat dilated entire stigma. Capsule enclosed in the perianth, 3-valved. Seeds few, black, not flattened, smooth but not shining, without any strophiole.—Perennials with fibrous roots not tuberous. Stems either short and densely tufted or elongated branched and diffuse. Leaves narrow-linear or subulate, in radical or terminal tufts, dilated at the base into scarious sheathing appendages, which are often produced at the top into simple or woolly-ciliate bristles. Flowers white or pink, in terminal pedunculate or sessile heads, with imbricate scarious bracts, the outer bracts empty usually entire and forming an involucre usually shorter then the perianths, the inner ones subtending each flower short very thin and transparent, jagged or fringed on the edge or more frequently divided to near the base into woolly hair-like segments, sometimes described as hairs of the receptacle.

The genus is limited to Australia. F. Mueller, Fragm. vii. 33, proposes to restore the name of *Laxmannia* to the Composite genus *Petrobium*, and to give to the present one the name of *Bartlingia*, but this disturbance of a long-adopted nomenclature would appear to me to be productive of much confusion, without any corresponding advantage.

Stems usually short and tufted. Peduncles very much longer than the leaves.
Outer perianth about 3 lines, inner less than half as long and broadly ovate . . . . 1. *L. grandiflora.*
Outer perianth about 2 lines, inner oblong, more than half as long.
Outer bracts few, obtuse, inner very short, fringed with long hairs . . . . 2. *L. squarrosa.*
Outer bracts more numerous, often acute, inner short and shortly jagged . . . . 3. *L. minor.*
Stems slender, elongated, branched and leafy. Peduncles slender, longer than the leaves.
Inner perianth-segments longer than the outer. Eastern species . . . . 4. *L. gracilis.*
Inner perianth-segments shorter than the outer. Western species . . . . 5. *L. ramosa.*
Heads sessile or on peduncles shorter than the leaves.
Stems slender, branched. Leaves usually elongated. Inner perianth-segments rather shorter or at length rather longer than the outer . . . . 6. *L. sessiliflora.*
Stems very short and densely tufted. Leaves mostly under ½ in long.
Leaves crowded along the short stems. Flower-heads rather broad, exceeding the leaves, the outer bracts numerous and obtuse . . . . 7. *L. brachyphylla.*
Leaves in terminal tufts longer than the heads. Outer bracts not numerous and mostly acute . . . . 8. *L. sessilis.*

1. **L. grandiflora,** *Lindl. Swan Riv. App.* 56.—Stems tufted when old, densely and shortly branched as in *L. squarrosa*. Leaves crowded as in that species but usually more erect, 1 to 2 in. long, the scarious sheaths terminating in long fringed bristles. Peduncles 6 to 10 in. long. Outer empty bracts of the head from 10 to 20, ovate, obtuse, scarious with brown centres, the outermost not 2 lines, the innermost above 3 lines long, the flowering ones about 4 lines and broadly oblong. Flowers 1, 2 or 3 within each bract on pedicels of ½ to 1 line, surrounded by long woolly hairs which fringe the base of the inner empty bracts or into which the subtending bracts are divided. Outer segments of the perianth oval-oblong, about 4 lines long, often very white, the inner ones broadly obovate, quite closed, about 1½ lines long. Stamens not exceeding the inner segments. Ovary stipitate.—F. Muell. Fragm. vii. 88.

W. Australia. Swan River, *Drummond*, *1st coll. and n.* 792.

Var. *paleacea.* This is a dwarf variety with short leaves which almost connects the species with *L. minor*, but it has the numerous obtuse empty bracts and the short broad inner perianth-segments of *L. grandiflora.*—*L. squarrosa*, Endl. in Pl. Preiss. ii. 42, not of Lindl.; *L. paleacea*, F. Muell. Fragm. i. 159.—Phillip's River, *Maxwell;* York District, *Preiss*, *n.* 1588; between Esperance Bay and Fraser's Range, *Dempster*, with very numerous outer empty bracts resembling the involucre of *Compositæ.*

2. **L. squarrosa,** *Lindl. Swan Riv. App.* 56.—Stems tufted when old, densely and shortly branched. Leaves crowded, almost subulate,

the lamina ½ to 1 in. long and straight or recurved, the sheathing imbricate bases with scarious margins produced at the top into bristles fringed with long hairs. Peduncles slender, more than twice the length of the leaves. Flower-heads when fully out 3 to 4 lines diameter or rarely more, ovoid when young, at length nearly hemispherical; outer empty bracts rather numerous, more acute than in *L. grandiflora*, the inner ones nearly as long as the flowers and often fringed at the base, those subtending the flowers very shortly entire at the base but fringed with numerous long hair-like segments. Perianth sessile or nearly so, the outer segments about 2 lines long, the inner oblong and more than half that length.—*L. grandiflora*, *L. acuta*, *L. pauciflora*, and *L. sylvestris*, Endl. in Pl. Preiss. ii. 42.

W. Australia. Swan River, *Drummond*, *1st coll. and n.* 36, 793, and 794; *Preiss*, *n.* 1586, 1589, 1591, 1592. The *L. pauciflora*, Endl. (Preiss, n. 1589), is, however, included here on the authority of Mr. Baker, who has seen the typical specimen. I have myself examined the others.

3. **L. minor,** *R. Br. Prod.* 286.—Very nearly allied to *L. squarrosa*. Stem short and tufted. Leaf-sheaths more ciliate than in *L. squarrosa*, and often rather densely covered with intricate woolly hairs, the blade ½ to ¾ in. long. Flower-heads on slender peduncles of 2 to 4 in. Outer bracts very few and much shorter than the perianths, the inner flowering ones very short and shortly fringed. Perianth often very white, as in *L. grandiflora*, about 2 to 2½ lines long, the inner segments more than half as long as the outer.—*L. Roei*, Endl. in Pl. Preiss. ii. 42; F. Muell. Fragm. vii. 88.

W. Australia. King George's Sound and adjoining districts, *R. Brown*, *Preiss*, *n.* 1585, *Oldfield*, *F. Mueller*, and others. In Brown's specimens the perianth is not white, but they are evidently starved and faded.

4. **L. gracilis,** *R. Br. Prod.* 286.—Stems slender, branched, forming loose tufts of 1 ft. or more. Leaves crowded at the base and ends of the branches, leaving leafless intervals of ½ to 1 in., the short broad sheathing scarious bases imbricate with a few woolly hairs on their margins, the blades filiform, erect or spreading, ½ to 1 in. long or in starved specimens shorter. Flower-heads small, on slender peduncles of several inches. Outer empty bracts few, very thin and transparent, ovate, quite entire and glabrous, 1 to 2 lines long; inner flowering ones short, more or less fringed with narrow teeth or ciliate with long woolly hairs at the base. Flowers pink, very shortly pedicellate or almost sessile, the segments about 2 lines or at length nearly 3 long, the outer ones rather shorter than the inner. Ovary contracted into a short stipes.—F. Muell. Fragm. vii. 88.

Queensland. Dawson River, *F. Mueller;* Rockhampton, *O'Shanesy.*
N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, *n.* 169, and *Fl. Mixt. n.* 522, and many others; northward to New England, *C. Stuart*, *Leichhardt;* Clarence River, *Beckler*, *Wilcox;* Liverpool Plains, *A. Cunningham;* southward to Illawarra, *A. Cunningham.*
Victoria. Mount Lizar and M'Alister River, *F. Mueller.*

Var. *illecebrosa* (?). Scarious sheathing bases of the leaves larger and more woolly hairy.—*L. illecebrosa*, Reichb. f. Beitr. Syst. Pflanzenk. 72 (?)—Herbert River, Queensland, *Armit*. I have not seen Frau Dietrich's specimens described by Reichenbach, but I do not see any character given to distinguish them specifically from the *L. gracilis*, which varies much in the degree of development of the branches, foliage, and inflorescence.

5. **L. ramosa,** *Lindl. Swan Riv. App.* 56.—Closely resembles *L. gracilis* in its long much-branched slender almost filiform stems with tufts of leaves separated by bare intervals, the filiform peduncles not quite so long. Flower-heads bracts and perianths the same as in that species, except that the inner segments of the perianth are rather shorter than the outer, even in the full-grown flower.—Endl. in Pl. Preiss. ii. 48; F. Muell. Fragm. vii. 88.

W. Australia. Swan River, *Drummond*, 1*st coll.*, *Preiss*, *n.* 1587.

6. **L. sessiliflora,** *Dcne. Herb. Tim. Descr.* 85, *t.* 16.—Stems much-branched, sometimes elongated and filiform; sometimes contracted into small dense leafy tufts. Leaves in tufts at the base of the branches and under the flower-heads and occasionally one or two small ones in the intervals, the sheaths very short with the scarious margins entire or jagged, the blade very narrow and rarely ¼ in. long. Flower-heads sessile within the leafy tufts, the outer scarious bracts very few, entire, shorter than the perianth, the inner ones under the flower shorter, mostly fringed with narrow teeth or woolly hairs. Flowers few in the head and sometimes solitary. Perianth scarcely 2 lines long, the segments narrow, the outer ones almost acute, at first rather longer but sometimes at length usually rather shorter than the inner obtuse ones.—*L. minor*, Hook. f. Fl. Tasm. ii. 60; F. Muell. Fragm. vii. 89, not of R. Br.

Victoria. Glenelg River, *Robertson*; Grampians, *F. Mueller*, *Sullivan*; Wilson's Promontory, *F. Mueller*.

Tasmania. Heathy places; abundant in some of the northern parts of the island, *J. D. Hooker*.

S. Australia. Encounter Bay, *Whitaker*; Lofty Ranges, *F. Mueller*.

W. Australia. Swan River, *Drummond*, 1*st coll. and n.* 795; Port Gregory and Murchison River, *Oldfield*; Phillips and Kalgan Rivers, *Maxwell*.

Decaisne figures the inner segments of the perianth as decidedly longer than the outer, and I have occasionally found them so, especially in Murchison River specimens, but they are most frequently as decidedly shorter, although perhaps growing out as the flowering advances. The specimens described by Decaisne were most probably from Shark's Bay.

7. **L. brachyphylla,** *F. Muell. Herb.*—A dwarf plant, rarely above 1 in. high, allied to *L. sessilis* and perhaps a variety, but much less branched. Leaves shorter and not so fine, occupying the greater part of the branches, the sheaths terminating in fringed appendages rather than in bristles. Flower-heads much broader with more numerous flowers and borne on peduncles of 1 to 2 lines. Outer bracts numerous and obtuse as in *L. grandiflora*; inner bracts divided nearly to the

base into woolly hairs as in *L. sessilis*, and perianths entirely as in that species.

W. Australia. King George's Sound or to the eastward, *Baxter*, and probably the same region, *Drummond, n.* 445; East Mount Barren, *Maxwell;* Upper Kalgan River and Perongerup, *F. Mueller;* between Esperance Bay and Fraser's Range, *Dempster.*

8. **L. sessilis,** *Lindl. Swan Riv. App.* 56.—Stems branched and densely tufted, the whole plant rarely above 1 in. high, the lower part of the branches covered with scarious leaf-sheaths. Leaves forming short terminal tufts, very narrow-linear, recurved, 3 to 8 lines long, the bristles of the sheaths few and long, simple or slightly divided. Flower-heads ovoid or oblong, sessile or nearly so, shorter than the leaves. Outer bracts not very numerous, mostly acute; inner ones divided nearly to the base into woolly hairs. Perianth sessile or nearly so, the outer segments about 2½ lines long, the inner ones ovate-oblong about ¾ lines long.—Endl. in Pl. Preiss. ii. 42.

W. Australia. Swan River, *Drummond, 1st coll.;* Hay District, *Preiss, n.* 1590; north of Stirling Range, *F. Mueller* (the latter specimens not fully out and somewhat doubtful).

37. STAWELLIA, F. Muell.

Perianth of 6 equal 3-nerved segments, shortly united at the base. Stamens 3, inserted at the base of the inner segments and shorter than them; filaments filiform or flattened; anthers linear or linear-lanceolate, erect, the cells opening inwards in longitudinal slits. Ovary 3-celled, with 2 ovules in each cell; style filiform entire. Capsule opening loculicidally in 3 valves. Seeds 1 or 2 in each cell, with a black shining crustaceous testa.—A tufted perennial, with linear filiform radical leaves, and simple scapes. Flowers in a dense terminal head, with imbricate bracts, the outer ones produced into filiform leaves.

The genus is limited to the single species endemic in West Australia.

1. **S. dimorphantha,** *F. Muell. Fragm.* vii. 85.—A slender glabrous perennial, forming dense tufts of 4 to 5 in. Leaves all radical except those of the flower-heads, linear-filiform, shorter than the scapes, with scarious imbricated dilated bases. Stems simple, rigidly filiform. Flower-heads 3 or 4 lines diameter, surrounded by rigidly filiform leaves or summits of the outer bracts often 1 in. long. Rhachis of the head or spike often branched though close and compact. Bracts scarious, imbricate. Flowers solitary and sessile within them, a few of the outer perianths in each head very narrow linear and 3 lines long, the others much shorter and broader. Filaments of the outer flowers filiform, of the inner ones short and flat. Capsule very small, enclosed in the perianth.

W. Australia. *Drummond.*

The remarkable difference in shape of the outer and inner flowers may be partly but not entirely caused by a difference in the degree of development. I have not succeeded in finding ripe capsules or seeds in any of the specimens, and have described them after F. Mueller.

38. JOHNSONIA, R. Br.

Perianth withering after flowering but at length deciduous, of 6 equal 3- or 5-nerved segments. Stamens 3, attached to the base of the inner segments and shorter than the perianth; filaments shortly dilated and connate at the base, tapering upwards; anthers linear, erect, continuous with the filament, the cells opening inwards in longitudinal slits. Ovary 3-celled, with two ovules in each cell, one erect the other pendulous; style filiform, with a terminal small stigma. Capsule nearly globular, opening loculicidally in 3 valves. Seeds 1 or 2 in each cell, oblong or ovoid, the funicle thickened into a black strophiole; testa crustaceous, black, smooth, and shining. Embryo linear, straight.—Tufted

Stems slender, usually 4 to 6 in. long and always shorter than the leaves. Spikes ¾ to 1 in. long, the bracts very pointed, rarely above ½ in. long, some or all of them more or less ciliate on the edges, the small lower empty ones usually not above 2 or 3, and the lowest less frequently produced into a leaf than in *J. lupulina*.—*J. hirta*, Lindl. Swan Riv. App. 57, t. 7; F. Muell. Fragm. vii. 87. *J. longifolia*, Endl. in Pl. Preiss. ii. 40.

W. Australia. Swan River, *Drummond*, 1*st coll. and n.* 210, 351, *and* 797, *Preiss*, *n.* 1584; Cape Naturaliste and Canning River, *Oldfield.*

Var. *filifolia*, F. Muell. Leaves almost filiform.—*J. mucronata*, Endl. in Pl. Preiss. ii. 40; Swan River, *Drummond*, *Preiss*, *n.* 1580.

3. **J. acaulis,** *Endl. in Pl. Preiss.* ii. 41.—A dwarf plant usually

glabrous or with a few woolly hairs near the base. Radical leaves narrow-linear, 2 to 3 in. long. Stems slender, simple or branched, 1 to 2 ft. high, with sometimes a little wool at the base of the branches. Flower-heads or spikes ovoid, about ½ in. long or rather more without the perianths, quite glabrous except a few woolly hairs bordering some of the bracts. Bracts imbricate, 3 to 4 lines long, either wholly scarious or the broad centres of some of the outer ones green rigid and striate. Perianth-tube narrow, cylindrical, about 3 lines long, the limb longer, blue, with 6 broad lobes, all 1-nerved according to Oldfield's notes, but of so delicate a texture as to be very imperfectly preserved in the dry specimens.

W. Australia. Swan River, *Drummond*, 1*st coll. n.* 777, *Preiss*, *n.* 2640; Murchison River, *Oldfield.*

2. **A. Preissii,** *Lehm.*, *Pl. Preiss.* ii. 42.—Very near *A. Drummondii*, but rather stouter, more rigid and more branched, sometimes producing tufts of short leaves at the bifurcations. Flower-heads of the same size, but the bracts all dry and brown, and densely covered with long woolly hairs. Perianth apparently smaller, but imperfect in the dried specimens.

W. Australia. Swan River, *Drummond*, 1*st coll. n.* 778, *Preiss*, *n.* 2226; Murchison River, *Oldfield.*

40. BORYA, Labill.

Perianth withering but persistent, hypocrateriform, the tube slender, cylindrical, the limb of 6 spreading nearly equal linear lobes. Stamens 6, inserted at the base of the lobes and as long as them or nearly so; filaments filiform; anthers short, erect, ovate-sagittate, the cells opening inwards in longitudinal slits. Ovary sessile, ovoid, 3-celled, with several (about 20) ovules in each cell, superposed in two rows; style filiform, with a small capitate stigma. Capsule enclosed amongst the persistent bracts, 3-valved. Seeds few, with a black crustaceous testa, without any strophiole.—Perennials with the stems either very short and tufted or elongated and branched, always densely covered with the closely imbricated persistent bases of the leaves. Leaves narrow-linear subulate or almost filiform, much crowded on the stock or on the upper part of the stems when elongated. Flowers in globular or ovoid heads on long peduncles. Bracts densely imbricated, a few of the outer ones empty, subulate, forming an erect or spreading involucre, the inner ones broad, usually obtuse, brown or black, each with a single flower sessile in its axil, the tube enclosed in a bracteole similar to the bract but broader, with inflected scarious margins.

The genus is limited to Australia.

Leaves various. Peduncle rarely above 3 in. Outer bracts usually longer than the flower head. Western species . . . . 1. *B. nitida.*
Leaves all erect subulate. Peduncle 6 to 10 in. Outer bracts rarely exceeding the head. North-eastern species . . . . 2. *B. septentrionalis.*

1. **B. nitida,** *Labill. Pl. Nov. Holl.* i. 81, *t.* 107.—A densely tufted perennial or low shrub, very variable in aspect according to age and situation, sometimes forming short tufts with the leaves almost radical and scape-like peduncles, but the stems often growing out to 6 in. or more, diffuse creeping or rarely erect, simple or branched, the lower portion covered with the persistent imbricate bases of the leaves and occasionally rooting. Leaves crowded in the upper portion, erect spreading or recurved, from under 1 in. to above 2. in. long, always ending in rigid pungent points. Scapes or peduncles erect, simple, rarely above 8 in. long. Flower-heads from ovoid to depressed-globular, 4 to 6 lines diameter. From 3 to 7 of the outer bracts empty, lanceolate-subulate or linear, very rigid and pointed, and some or all of them longer than the head; inner flowering bracts brown or black, 2 to 4 lines long, all very obtuse or a few of the outer ones almost acute or empty and passing into the involucral bracts. Bracteoles enclosing the flowers as long as the bracts. Perianth-tube as long as the bract, the lobes linear and nearly the same length.—R. Br. Prod. 286; F. Muell. Fragm. vii. 87; *B. lucens*, Poir. Dict. viii. 615 (probably a clerical error for *B. nitida*, though taken up by Kunth. Enum. iv. 645, as distinct); *Baumgartenia nitida*, Spreng. Syst. ii. 91.

W. Australia. Apparently abundant from King George's Sound, *Brown*, *Labillardière*, and many others, to Swan and Murchison Rivers, *Drummond*, *Oldfield*, and many others, and eastward to Cape Arid, *Maxwell*.

The aspect of the specimens varies so much that the inspection of a few only has induced the establishment of several species, but they are connected by so many intermediates that it becomes difficult to define distinct varieties. In the commonest form the leaves are slender, rarely above 1½ in. long, spreading or recurved, especially in the short tufted state, straighter and more rigid in the more elongated and branched forms or states. The former state includes *B. scirpoidea*, Lindl. Swan Riv. App. 57, t. 9; Drummond's specimens, *n.* 341; Preiss's *n.* 1597, etc. The latter is Labillardière's original form and that to which Brown gave Labillardière's name, as well as Drummond's *n.* 796 (*1st coll.*), Preiss's *n.* 1593, etc.

B. gracilis and *B. cataractæ*, Endl. Pl. Preiss. ii. 43, Preiss, *n.* 1596 and 1594 are small states of the common form.

B. sphærocephala, R. Br. Prod. 286 (*B. lucens*, Endl. in Pl. Preiss. ii. 43, Preiss, *n.* 1595; *Baumgartenia sphærocephala*, Spreng. Syst. ii. 91), is a large variety with rigid leaves sometimes nearly 1 line broad and nearly 2 in. long, but connected with the common fine-leaved form by numerous intermediates.

B. sublanosa, F. Muell. Herb., Drummond, *n.* 98, is a dwarf variety with the younger leaves more or less sprinkled with long loose woolly hairs.

Maxwell's specimens from Cape Arid show a remarkably rigid variety.

2. **B. septentrionalis,** *F. Muell. Fragm.* v. 41.—Stems short, erect. Leaves in dense tufts, very erect and rigid though fine, 1½ to 2 in. long. Peduncles 6 to 10 in. long. Flower-heads ⅓ to ½ in. diameter, with very numerous flowers, the flowering bracts longer than in *B. nitida*, and the outer involucral bracts usually shorter than the head. The structure of the flowers and other characters precisely the same as in *B. nitida*, from which this species is most distinctly separated by geographical position.

Queensland. Fissures of rocks, Rockingham Bay, *Dallachy*.

ORDER CXXVIII. PONTEDERACEÆ.

Flowers usually slightly irregular, hermaphrodite. Perianth inferior, with or without a distinct tube, the limb or whole perianth of 6 coloured petal-like lobes or segments, imbricate in 2 series, all nearly equal and similar. Stamens 6 or 3, attached to the base of the lobes or segments, often dissimilar; anthers 2-celled, opening laterally or inwards by longitudinal slits or terminal pores. Ovary superior, 3-celled or with 3 parietal placentas, with 1 or more ovules to each cell or placenta; style single with a terminal 3-lobed or 6-toothed stigma. Fruit a capsule, opening loculicidally in 3 valves, but sometimes enclosed in the persistent tube of the perianth. Seeds albuminous, with a slender embryo, the radicle next to the hilum.—Aquatic herbs. Leaves usually petiolate, with numerous parallel veins. Flowers blue or white, in spikes or racemes proceeding from the sheath of the last or only leaf of the scape, usually with 1 or 2 sheathing bracts at the base of the peduncle.

A small order dispersed over the tropical and sub-tropical regions of both the New and the Old World, extending in North America to more temperate districts. The only Australian species belongs to a genus confined to the Old World, whilst the other genera are exclusively American. The order only differs from Liliaceæ in the aquatic habit and the slight irregularity of the flower.

1. MONOCHORIA, Presl.

(Limnostachys, *F. Muell.*)

Perianth nearly regular, divided to the base into 6 segments. Stamens 6, 1 usually larger or otherwise different from the others. Ovary 3-celled, with numerous ovules in each cell.—Leaves radical on long petioles. Scapes with a single apparently petiolate leaf, the short raceme in its axil appearing to proceed from a swelling in the middle of the petiole.

The genus contains very few species limited to the Old World; the only Australian one is, as far as known, endemic.

1. **M. cyanea,** *F. Muell. Fragm.* viii. 44.—Stems or rhizomes creeping in mud or shortly ascending in water, covered with long thin membranous sheathing scales, one or two of the lower ones produced into a leaf or a long petiole, the lamina ovate, acuminate, rounded or cordate at the base, 1½ to 3 in. long. Scapes from the axils of the upper sheaths with their terminal leaves at first resembling the lower leaves with a similar lamina, but with a swelling in the middle of the petiole which proves to be the sheathing base of the single leaf, from whence issues a shortly pedunculate loose spike or raceme of 3 to 10 flowers, the base of the peduncle enclosed in a membranous sheath. Flowers sessile or very shortly pedicellate, without bracts. Perianth blue, the segments 5 or 6 lines long or at length rather more, shortly united at the base. Filaments dilated, all nearly equal, without any tooth, one anther often a little longer or smaller than the others but sometimes scarcely different, all opening at first in terminal pores which are afterwards slit down to the

base. Seeds ovoid, with 10 to 12 prominent ribs.—*Limnostachys cyanea*, F. Muell. Fragm. i. 24.

N. Australia. Upper Victoria River, *F. Mueller;* Gilbert River, *Gulliver*.
Queensland. Port Denison, *Fitzalan ;* Burdekin River, Rockhampton and neighbourhood, *Bowman*, *Thozet*, *O'Shanesy*, and others.

The species is very near to the common East Indian *M. vaginalis*, Presl, but the flowers are more sessile, and the stamens are nearly equal without the tooth on the filament of the odd stamen characteristic of both the Indian species.

ORDER CXXIX. PHILYDRACEÆ.

Flowers hermaphrodite, irregular. Perianth inferior, persistent, divided to the base into 2 broad petal-like segments, anterior and posterior. One perfect stamen, attached to the base of the anterior segment or almost hypogynous; filament flattened; anther variously shaped, attached at the base or adnate, with 2 parallel cells, straight or twisted, opening in longitudinal slits; staminodia 2, hypogynous, alternating with the perianth-segments, flat and somewhat petal-like but small, free or more or less connate at the base with the anther-bearing filament. Ovary superior, 3-celled or with 3 parietal placentæ, projecting far into the cavity; style terminal, simple, with a small or broad terminal stigma; ovules numerous in each cell or placenta, anatropous. Fruit a capsule, opening loculicidally in 3 valves. Seeds numerous, small; testa membranous. Embryo small, at the base of a fleshy albumen.—Erect herbs. Leaves linear or flag-like. Flowers sessile and solitary within more or less sheathing bracts along the rhachis of a simple spike, or along the simple branches of a terminal panicle.

The order is limited to the three Australian genera, and is almost endemic. One species only extends into east tropical Asia, and one of uncertain origin may be a native of the Pacific Islands.

Anther terminal, very much twisted. Ovary imperfectly 3-celled. Leaves flag-like. Spike long, simple . . .	1. PHILYDRUM.
Anther not twisted but reflexed outwards. Ovary perfectly 3-celled. Leaves few, narrow. Spike short, simple . .	2. PRITZELIA.
Anther erect, on a very short filament. Ovary perfectly 3-celled. Leaves flag-like. Spikes in a terminal branched panicle	3. HELMHOLTZIA.

1. PHILYDRUM, Banks.

Perianth-segments many-nerved, the margins slightly involute in the bud. Stamen attached to the base of the anterior segment and not exceeding it; filament flattened, tapering upwards; anther terminal, transverse, the cells excessively twisted; staminodia hypogynous, but often slightly connate at the base with the anther-bearing filament. Ovary 1-celled, with 3 parietal placentæ projecting far into the cavity but not meeting in the centre, each with 2 divaricate broad lobes covered on the inner or under surface with very numerous ovules; style columnar, with a terminal broad 3-angled stigma. Capsule oblong, opening loculicidally in 3 valves. Seeds very numerous and small, narrow-oblong, brown with black tips, minutely tuberculate, with a short pale funicle. —Tall perennial, with flag-like leaves. Flowers sessile within sheathing bracts along the rhachis of a long terminal spike.

The genus is limited to the single Australian and East Asiatic species, the *P. glaberrimum* of the 'Botanical Magazine' being a species of *Helmholtzia*.

1. **P. lanuginosum,** *Banks in Gærtn. Fruct.* i. 62.—Roots fibrous. Stem erect, simple or scarcely branched, about 2 ft. high, with more or less of white wool especially on the inflorescence, wearing away with age. Leaves from under 1 ft. to 1½ ft. long, distichous sheathing and equitant at the base of the stem, the upper ones shorter and passing into short lanceolate or ovate-lanceolate sheathing bracts, all however longer than the perianth, the inflorescence forming a long terminal interrupted spike, more woolly than the rest of the plant. Flowers closely sessile, solitary or rarely two together within each bract. Perianth-segments yellow, hairy, about ½ in. long and nearly as broad. Capsule about ¼ in. long, the pericarp thin, opening tardily in 3 valves.—R. Br. Prod. 265; Kunth, Enum. iii. 380; Guillem. Ic. Pl. Austral. t. 5; Bot. Mag. t. 783.

N. Australia. Port Darwin, *Schultz*, n. 444.

Queensland. Sandy Cape, Keppel Bay, Broad Sound, *R. Brown*; Rockhampton and neighbourhood, *Bowman*, *O'Shanesy*, and others; Rockingham Bay, *Dallachy*; Port Curtis, *M'Gillivray*; Cape York, *Daemel.*

N. S. Wales. Port Jackson and Shoalwater Bay, *R. Brown*; New England, *C. Stuart*; Hastings River, *Beckler*; Clarence River, *Wilcox*; Mount Elliott, *Fitzalan*.

Victoria. Upper part of the Wimmera, *Wilhelmi.*

The same species ranges over the Malayan Peninsula and Archipelago and South China.

2. PRITZELIA, F. Muell.

(Hetæria, *Endl.*)

Perianth-segments many-nerved. Stamen almost hypogynous, at the base of the anterior segment; filament broad and flat, connate to about the middle with the 2 lateral petal-like staminodia; anther oblong, abruptly reflexed outward from the apex of the filament, the cells parallel, not twisted, opening in longitudinal slits. Ovary perfectly 3-celled; style columnar, with a slightly dilated terminal stigma. Capsule oblong, membranous, opening loculicidally in 3 valves, leaving a persistent central placentiferous column. Seeds numerous, small, oblong, brown, minutely tuberculate.—A small plant with a simple erect stem, few narrow leaves. Flowers sessile within concave bracts in a short terminal spike.

The genus is limited to the single West Australian species.

1. **P. pygmæa,** *F. Muell. Descr. Pap. Pl.* i. 13.—Stock apparently perennial, almost thickened into a small bulb more or less woolly, the rest of the plant glabrous. Stem simple, slender, erect, 3 to 6 in. high. Leaves 1, 2, or 3, narrow-linear, shorter than the stem, with a narrow sheathing base, the uppermost one with a broader sheath and short lamina. Flowering-bracts sheathing, 3 to 6 lines long without any or

only a very short point, distichous and imbricate when young, forming an interrupted terminal spike when in flower. Perianth-segments very broadly ovate, not at all or scarcely exceeding the bract. Stamen considerably shorter.—*Philydrum pygmæum*, R. Br. Prod. 265; *Hetæria pygmæa*, Endl. in Pl. Preiss. ii. 45.

W. Australia. King George's Sound, *R. Brown*, *Preiss*, *n.* 2223, *F. Mueller*; Swan River, *Drummond*, 1*st coll. and n.* 739, 740; Lake Muir, *Muir*.

3. HELMHOLTZIA, F. Muell.

Perianth-segments faintly several-nerved, ovate-lanceolate, membranous, almost petal-like, the posterior one with 2 prominent nerves near the margin. Stamen almost hypogynous at the base of the anterior segment; filament very short and flat; anther erect, ovate-oblong, much longer than the filament, the cells parallel, not twisted, opening inwardly in longitudinal slits; staminodia petal-like, short and broad, very shortly connate with the anther-bearing filament. Ovary perfectly 3-celled; style subulate with a minute terminal stigma. Capsule nearly globular, 3-furrowed, the pericarp rather thick but probably at length 3-valved. Seeds numerous, small, dark-brown, smooth.—Tall erect perennial, with long almost radical flag-like leaves and numerous small flowers in a terminal pyramidal panicle.

Besides the Australian species, which is endemic, the genus includes the *Philydrum glaberrimum*, Hook. Bot. Mag. t. 6058, of uncertain origin, but believed to have been from the Pacific Islands.

1. **H. acorifolia**, *F. Muell. Fragm.* v. 203.—Stems erect, simple except the inflorescence, 2 to 3 ft. high, quite glabrous or with a slight wool about the inflorescence. Leaves nearly radical, flag-like, erect, 2 to 3 ft. long and ½ to near 1 in. broad, their short sheathing bases distichous and imbricated. Flowers in a dense terminal pyramidal panicle of 6 in. to 1 ft., sessile along its branches, within lanceolate acuminate bracts, spreading under the flower and scarcely exceeding it. Perianth-segments white, with inflexed margins, 3 or scarcely 4 lines long. Capsules 2 to 3 lines diameter, woolly-villous, not seen open although the seeds appear ripe with a perfect embryo. Seeds oblong, many of them truncate or almost hooked at the apex, and sometimes narrowly winged.

Queensland. Rockingham Bay, *Dallachy*.
N. S. Wales. Richmond River, *Wilcox*.

ORDER CXXX. XYRIDEÆ.

Character and geographical range of the order the same as that of the typical genus *Xyris*, in so far as connected with Australia; how far this character should be extended so as to comprise the American genera often associated with it, is as yet far from being settled. The affinities of the genus or order are also very uncertain. Either the habit or the seeds or the inflorescence have suggested to various botanists its approximation to Restiaceæ, Commelynaceæ, or Liliaceæ (*Johnsonieæ*), but there are important characters which separate it from each of these.

1. **XYRIS**, Linn.

Flowers hermaphrodite, sessile within 2 opposite persistent navicular bracteoles by some considered as outer perianth-segments. True perianth with a short tube, the limb divided into 4 segments, 1 outer anterior one thin and almost petal-like or somewhat scarious, very broad, completely enveloping the inner segments, but becoming detached at the base and cast off as the flower expands, 3 inner broad yellow petal-like spreading segments, withering after flowering. Perfect stamens 3, opposite the inner segments, attached to their base and shorter than them; anthers erect, sagittate, with 2 cells opening laterally in longitudinal slits somewhat turned outwards; staminodia usually 3, alternating with the inner segments, short and filiform, with a terminal tuft of jointed hairs or an imperfect anther, or in some species wholly deficient. Ovary sessile, imperfectly 3-celled; ovules numerous on 3 placentas, either basal and confluent or elongated parietal and quite distinct, or sometimes separating from the sides of the ovary except at the base and apex. Style single, divided at the end into 3 spreading branches, each terminating in a capitate or dilated stigma. Capsule globular or ovoid, often 3-furrowed, opening loculicidally in 3 valves or sometimes circumsciss, the hardened apex falling off entire. Seeds small and numerous, linear or oblong, usually striate; embryo lenticular, applied to the extremity of the albumen furthest from the hilum.—Tufted perennials or rarely annuals. Leaves radical or surrounding the base of the scape or stem, linear and grass-like or rigid and subulate or rush-like. Flowers solitary and sessile within imbricate rigid glume-like scales, forming a terminal head or short spike on a simple leafless scape, the outer bracts of the head usually empty and in some varieties of various species somewhat enlarged into a small involucre.

The genus is widely spread over the warmer regions both of the New and the Old World. Of the Australian species, one is identical with a common Asiatic one, the others are, as far as hitherto ascertained, all endemic.

I have described the 2 outer navicular scarious or glume-like organs outside the perianth as bracteoles from their position at the base of the perianth as well as from their consistence and persistence, whilst the broad segment enveloping the inner ones is evidently the real outer perianth, being placed like the inner segments at the apex of the tube.

Placentas of the ovary parietal, free from each other and extending to the apex of the cavity.
  Bracts entire or minutely ciliate. Anther-cells dorsally affixed to a small connective. Staminodia penicillate. Eastern or tropical species.
    Leaf-tufts on a perennial stock, with rigid sheathing bases. Staminodia densely penicillate . . . . 1. *X. complanata.*
    Leaf-tufts annual. Leaves grass-like. Staminodia very slender, with few hairs or scarcely any . . 2. *X. pauciflora.*

Bracts with black jagged margins. Anther-cells adnate the greater part of their length. No staminodia. Western species.
Flower-heads globular. Bracts very broad . . . . 3. *X. lacera.*
Flower-heads ovoid or oblong. Bracts ovate . . . . 4. *X. flexifolia.*
Placentas very short and confluent at the base of the ovary. Other characters of *X. operculata*, but bracteoles not winged . . . . 5. *X. gracilis.*
Placentas connate at the base of the ovary, extending also up the sides. Capsule usually hardened at the apex.
Staminodia densely penicillate. Bracteoles with a prominent or winged usually ciliate keel.
Bracts broad, glabrous, appressed, entire or the inner ones jagged. Eastern species . . . . 6. *X. operculata.*
Bracts ovate-oblong, hirsute or plumose at the end. Western species . . . . 7. *X. lanata.*
Bracts ovate-oblong, loosely imbricate or spreading, glabrous. Western species . . . . 8. *X. laxiflora.*
Staminodia small, transversely dilated at the end, without hairs. Bracts broad, entire. Western species . . 9. *X. gracillima.*

X. altissima, Lodd. Bot. Cab. t. 1900, by a horticultural error supposed to be Australian, is evidently *Bobartia spathacea*, Sweet, from South Africa.

1. **X. complanata,** *R. Br. Prod.* 256.—Stock perennial. Leaves tufted, generally surrounded by a few old brown sheaths, grass-like, flat, often very narrow, varying from 1 or 2 to above 3 in. long. Scape more or less flattened, from under 1 ft. to about 1½ ft. high. Flower-head at first short and ovoid, but sometimes lengthening into a cylindrical spike of ½ to 1 in., the scales broad, light-brown, entire or the inner ones slightly ciliate, the lower empty ones very few. Bracteoles prominently keeled or with a narrow dorsal shortly ciliate wing. Inner perianth-segments broad but small. Anther-cells quite distinct, dorsally attached to a small connective; staminodia densely penicillate. Style divided nearly to the base. Placentas of the ovary free from each other and extending to the apex of the cavity. Seeds very numerous and small.—*X. lævis* and *X. scabra*, R. Br. Prod. 256; *X. elongata*, Rudge in Trans. Linn. Soc. x. 289, t. 15; F. Muell. Fragm. viii. 205.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* Bathurst Island, *A. Cunningham;* Sea Range and Victoria River, *F. Mueller;* Port Darwin, *Schultz*, *n.* 128.

Queensland. Facing Island (*X. lævis*), *R. Brown;* Moreton Bay, *F. Mueller* and others; Rockhampton, *O'Shanesy;* Endeavour River, *A. Cunningham;* Rockingham Bay, *Dallachy;* Port Denison, *Fitzalan.*

N. S. Wales. Port Jackson (*X. scabra*), *R. Brown*, *Woolls*, and others; Hastings River and Mount Mitchell, *Beckler.*

The species is also in East India if *X. Walkeri*, Wight in Kunth, Enum. iv. 19, be really identical, as it appears to be.

Var. *bracteata.* Outer scales of the flower-head enlarged into spreading bracts of 3 to 4 lines.—Moreton Bay, *Leichhardt.*

Var. ? *leptocaulis.* Scapes very narrow, scarcely compressed or angular-terete. Flower-heads small and short. Flowers not examined.—Cape York, *M'Gillivray;* Upper Brisbane River and Providence Hill, *F. Mueller.*

2. **X. pauciflora,** *Willd. Phytogr.* i. 2, t. 1.—Apparently annual. Leaves in radical tufts, grass-like, narrow, rarely above 6 in. long.

Scapes sometimes only 2 or 3 in. high, but varying from that to 1 ft. or rather more, terete or slightly flattened. Flower-head ovoid-globose, attaining 4 to 5 lines diameter when full-grown but often very much smaller, the scales very broad, entire, brown with very thin almost hyaline margins. Bracteoles thin and light-coloured, quite glabrous, without prominent keels. Perianth small for the genus. Anthers almost sessile, the cells quite distinct dorsally attached to a small connective; staminodia very slender, with very few terminal hairs and often very difficult to find. Capsule obovoid, the placentas adnate to the apex of the valves.—Kunth, Enum. iv. 17; *X. pauciflora*, *X. paludosa*, *X. denticulata*, and *X. pusilla*, R. Br. Prod. 256; *X. oligantha*, Steud. Syn. Glum. ii. 288.

N. Australia. M'Adam Range and Victoria River, *F. Mueller*; Port Essington, *Armstrong*.

Queensland. Endeavour River, *Banks and Solander*, *A. Cunningham*; between Norman and Gilbert Rivers, *Gulliver*.

The species is also widely spread over tropical Asia. Brown's four species were all described from Banks and Solander's Endeavour River specimens, and appear to me to differ only in size and luxuriance: the two smallest slender forms, 2 to 3 in. high with very small heads (*X. paludosa* and *pusilla*), gathered in the same locality by Cunningham, represent well Willdenow's figure; the larger forms are, however, more frequent in Indian as well as in Australian collections.

3. **X. lacera,** *R. Br. Prod.* 257.—Stems rather stout, terete, varying from under 1 ft. to above 2 ft. high, surrounded at the base by a few long, broad, loose, brown leaf-sheaths, of which 1, 2, or 3 are produced into blades of 2 or 3 in. Flower-heads ovoid or globular, under ½ in. diameter. Scales very broad, their black margins much jagged, the centre usually paler coloured. Bracteoles with an obtuse keel slightly prominent and minutely scabrous. Inner perianth-segments ovate. Anthers oblong, rather large. Staminodia none in any of the flowers examined. Placentæ of the ovary free from each other and adnate to the apex of the cavity. Style long, with very short branches dilated into fan-shaped stigmas. Capsule hardened and scarcely dehiscent at the apex, opening laterally. Seeds pale-coloured, striate.

W. Australia. King George's Sound and adjoining districts, *R. Brown*, *Drummond*, *n.* 200, 354, *Oldfield*, *F. Mueller*.

X. teretifolia, R. Br. l. c. from Lucky Bay, appears to be the same species with rather smaller heads.

4. **X. flexifolia,** *R. Br. Prod.* 256.—Stems very slender, twisted, usually 1 ft. high or rather more, with a single long brown sheath at the base and sometimes a second sheath produced into a slender terete twisted leaf resembling the stem. Flower-head oblong or narrow-ovoid, 3 to 4 lines long. Scales ovate, glabrous, the black margins jagged, the centre of the flowering ones pale-coloured. Bracteoles narrow, obtuse, and obtusely keeled. Outer perianth-segment more petal-like than in most species; inner segments ovate-oblong, much narrower than usual. Anthers linear-oblong, the cells almost entirely adnate; no staminodia in

the flowers examined. Ovary narrow, the placentas free from each other and adnate to the apex of the cavity. Style rather long, with short branches and entire fan-shaped stigmas. Ovules few and narrow. Capsule not seen ripe.—*X. æmula*, Endl. in Pl. Preiss. ii. 55.

W. Australia. King George's Sound and adjoining districts, *R. Brown*, *Drummond*, *n.* 254, *partly*, *Preiss*, *n.* 2221.

5. **X. gracilis,** *R. Br. Prod.* 256.—Very similar to the narrow-headed specimens of *X. operculata*, and not always easy to distinguish from them. Leaves usually shorter, flatter, and more twisted, sometimes nearly 1 line broad, but in some varieties as narrow as in that species. Flower-heads ovoid-oblong, the scales black and entire. Bracteoles smooth and shining, entire, without dorsal wings. Inner perianth-segments very broad, but rather smaller than in *X. operculata*. Ovary partially 3-celled, the placentas confluent at the base, with linear erect ovules, and not extending much up the sides of the cavity.—Hook. f. Fl. Tasm. ii. 69; *X. juncea*, R. Br. Prod. 256.

Queensland. Brisbane River, *Bailey*.

N. S. Wales. Port Jackson to the Blue Mountains (*X. juncea*), *R. Brown*, *Woolls*, and others; New England, *C. Stuart*, *C. Moore*; Hastings River, *Beckler*.

Victoria. Port Phillip, *R. Brown* (*X. gracilis*); Glenelg River, *Robertson*; Dandenong Ranges, *F. Mueller*; Curdie's Inlet, *Walker*.

Tasmania. Common in various places in similar localities to *X. operculata*, *Gunn* and others.

Var. *bracteata*. Flower-heads broader, the outer scales enlarged into spreading bracts, bracteoles broader than in the common form, with slightly prominent and minutely ciliate dorsal keels, but the ovary rather of *X. gracilis* than of *X. operculata*. —South Port, Tasmania, *C. Stuart*; between Circular Head and Arthur River, *F. Mueller*.

6. **X. operculata,** *Labill. Pl. Nov. Holl.* i. 14, t. 10.—Stock perennial, with persistent tufts of distichous shining brown leaf-sheaths, some of them produced into very narrow almost subulate leaves, mostly under 6 in. long. Scapes slender, 1 to 1½ ft. high, enclosed at the base in a rather long sheath without any lamina in the centre of the tuft of leaves. Flower-head from ovoid to globular, attaining sometimes 4 to 6 lines diameter, but often much smaller, the scales black, broad and rounded, entire or the inner ones denticulate or fringed at the end. Bracteoles opaque with scarious margins, the prominent keel usually ciliate or fringed at the end. Inner perianth-segments very broadly obovate, 4 to 6 lines diameter. Anthers deeply lobed at the base and shortly so at the upper end. Staminodia filiform, with a dense tuft of jointed hairs. Style rather long, the terminal stigmas variously dilated. Placentas of the ovary more or less cohering in the axis, and continued to the apex of the cavity, though sometimes at length detached from the sides. Capsule obovoid, the hardened apex usually falling off entire, the lower part only splitting into valves.—R. Br. Prod. 257; Hook. f. Fl. Tasm. ii. 69; Bot. Mag. t. 1158; Lodd. Bot. Cab. t. 205.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *A. and R. Cunningham*, and many others; Hastings River, *Beckler*; New England, *C. Stuart*.

Victoria. Mount Eversley, *Robertson*; Mount Abrupt, *Wilhelmi*; Curdie's River, *F. Mueller*.

Tasmania. Port Dalrymple, *R. Brown*; common in wet heaths and peat soils, *J. D. Hooker*.

S. Australia. Encounter Bay, *C. Stuart*.

The species varies much in stature, in the size of the heads, and in the scales of the flower-heads, either distinctly superposed in five rows or more or less irregularly imbricate, the outer empty ones few or numerous, and the flowering ones almost all quite entire or more or less jagged or fringed.

Var. *macrocephala*. Stems above 2 ft. high. Flower-heads ½ in. diameter, the scales almost all fringed.—Blue Mountains, *A. and R. Cunningham*, *Woolls*.

Var. *bracteata*. A few of the outer empty scales of the flower-head enlarged and spreading.—*X. bracteata*, R. Br. Prod. 256.—Port Jackson, *R. Brown*.

7. **X. lanata,** *R. Br. Prod.* 257.—Stock perennial. Leaves few in the tufts, almost distichous, 1 or 2 of them from 6 in. to 1 ft. long, above 1 line broad near the base, but tapering to a long fine point. Scapes often 2 or even 3 ft. long, not flattened. Flower-head ovoid, about ½ in. long, the scales oblong-spathulate, usually superposed in 5 distinct rows, hirsute outside or almost plumose at the end, the outer ones often woolly-villous to the base. Bracteoles with winged keels, ciliate at the end, and the outer perianth-segment often tubercular-hirsute at the end. Staminodia filiform, with a dense tuft of jointed hairs. Stigmas much dilated. Capsule with a hardened apex as in *X. operculata*. Placentas slightly connate at the base, extending up the sides of the cavity but not into the hardened apex. Ovules and seeds ascending from the lower part of the cavity almost as in *X. gracilis*.—Endl. in Pl. Preiss. ii. 55.

W. Australia. King George's Sound and adjoining districts, *R. Brown*, *Fraser*, *A. Cunningham*, *Drummond*, *n.* 201, 354, *Preiss*, *n.* 2222, and others.

8. **X. laxiflora,** *F. Muell. Fragm.* viii. 203.—Apparently annual. Leaves tufted, flat, narrow, the inner ones 4 to 6 in. long, the outer shorter. Scapes rather slender, 1 to 2 ft. high. Flower-head ovoid, about ½ in. long, the scales broad, quite entire, dark or black with a pale centre, less closely imbricate than in the other species, and the outer one often spreading. Bracteoles with a prominent almost winged keel, shortly ciliate or denticulate. Inner perianth-segments broad but not large. Anthers short; staminodia with a dense tuft of hairs. Ovary pubescent and shortly 3-lobed at the apex; placentas united at the base and adnate upwards, but not extending to the apex; stigmas slightly dilated and minutely fringed. Ovules few, erect. Capsule hardened at the apex but not seen ripe.

W. Australia. *Drummond*, *n.* 202.

9. **X. gracillima,** *F. Muell. Fragm.* viii. 203.—Stems or scapes as in *X. flexifolia* slender, almost filiform, with brown sheaths at their base rarely produced into leaves, but more tufted than in that species, and mostly above 1 ft. high. Flower-head ovoid or obovoid, 3 to 4 lines long, quite glabrous, the scales broad, with black margins quite entire

and paler centres. Bracteoles obtuse and obtusely keeled, quite glabrous. Inner perianth-segments ovate. Anther linear, oblong, scarcely lobed at the base, with very short filaments; staminodia ending in a transverse dilatation without any hairs. Ovary narrow, hirsute and 3-lobed at the top; placentas connate at the base with few long ovules. Style slender, with 3 filiform branches and very small capitate stigmas.

W. Australia, *Drummond, n.* 199.

ORDER CXXXI. COMMELYNACEÆ.

Flowers hermaphrodite or rarely polygamous, usually slightly irregular. Perianth of 6 segments, free or rarely united at the base, more distinctly representing a calyx and corolla than in any other syncarpous Monocotyledons, 3 outer ones thin and membranous or herbaceous, much imbricate, the outermost often smaller, 3 inner very delicate and petal-like, spreading, one often rather different in shape or size from the others. Stamens 6 or fewer by abortion, attached to the base of the segments or almost hypogynous; anthers when perfect 2-celled, the cells opening laterally or inwards in longitudinal slits or rarely in terminal pores; staminodia when substituted for stamens all on one side of the flower, not alternating with the perfect stamens. Ovary 3-celled or rarely 2-celled, with 1, 2 or more orthotropous ovules in each cell, laterally attached to the inner angle and when several superposed in 1 or 2 rows. Style simple, with a terminal entire or 3-lobed stigma. Fruit a capsule or rarely indehiscent though dry. Seeds thick, peltate or angular, the testa often wrinkled or reticulate. Embryo small, partly sunk in the side of the fleshy albumen remote from the hilum, and usually covered by a small deciduous operculum.—Herbs erect or more frequently weak and creeping at the base, rarely in species not Australian twiners, or tall and almost shrubby. Leaves parallel-veined, with sheathing bases. Flowers usually blue, purple, or white, in panicles, umbels, or clusters, either terminal or issuing from the leaf-sheaths on the side of the stem opposed to the leaf.

The order is chiefly tropical or subtropical, and is common to the New and the Old World. Of the six Australian genera, three are spread over both hemispheres, one is limited to the Old World, one to the Indo-Australian region, and one only is endemic in Australia.

Flowers enclosed in a folded, cordate-turbinate or falcate spatha or leafy bract, or within short loose leaf-sheaths.
  Perianth-segments united in 2 series. Stamens all perfect. 1. CYANOTIS.
  Perianth-segments free. Half the stamens reduced to staminodia . . . . 2. COMMELYNA.
No spatha. Bracts small. Flowers paniculate.
  Half the stamens reduced to staminodia. Ovary and capsule 3-celled . . . . 3. ANEILEMA.

Stamens all perfect. Ovary and capsules 2-celled . . . 4. FLOSCOPA.
Stamens all perfect or half reduced to staminodia. Fruit globular, indehiscent, usually blue . . . . 5. POLLIA.
No spatha. Flowers spicate. Outer segments herbaceous.
Stamens all perfect. Ovary 3-celled . . . . 6. CARTONEMA.

1. CYANOTIS, Don.

(Zygomenes, *Salisb.*, name only).

Flowers regular. Outer perianth-segments more or less united in a 3-lobed calyx, inner segments more or less united in a tube at the base with 3 spreading lobes. Stamens 6, inserted on the inner segments; filaments bearded towards the top; anthers all perfect, the cells opening inwards in longitudinal slits. Ovary 3-celled, with 2 superposed ovules in each cell. Capsule 3-valved. Seeds laterally attached, one at the lower angle, the other at the upper angle.—Creeping or ascending herbs. Flowers in short dense spikes or clusters, in a complicate falcate leafy bract or spatha, or within loose leaf-sheaths.

The genus is dispersed over the tropical regions of Asia and Africa, the only Australian species is a common Indian one from Ceylon and the Peninsula to the Malayan Archipelago and South China.

1. **C. axillaris**, *Rœm. and Schult.; Kunth, Enum.* iv. 105.—A glabrous annual, with long creeping or shortly ascending branches. Leaves linear or linear-lanceolate, 2 to 4 in. long. Flowers 2 or 3 together within the short loose leaf-sheaths. Outer perianth-segments nearly 3 lines long, shortly united at the base; inner perianth deep blue, the tube slender, cylindrical, longer than the outer segments. Filaments thickened above a dense tuft of jointed hairs.—*Tradescantia axillaris*, Roxb. Corom. Pl. t. 107; *Zygomenes axillaris*, Salisb. in Trans. Hort. Soc. i. 271; F. Muell. Fragm. viii. 62; *Cyanotis axillaris*, Clarke, Comm. et Cyrt. Beng. t. 35 (copied from Roxburgh).

N. Australia. Sturts' Creek, *F. Mueller.*
Queensland. Elliott and Burdekin Rivers, *Bowman.*

The species is a common Indian one. Salisbury, in giving to it the name of *Zygomenes*, gave no indication of the extent or character he proposed to assign to it as a genus; it cannot therefore be taken as such a publication as necessarily to supersede the universally adopted name *Cyanotis.*

2. COMMELYNA, Linn.

Perianth-segments all free, 2 of the outer ones larger than the third outermost, and one of the inner frequently differently shaped or more sessile than the two others. Perfect stamens usually 3, the central one with a larger anther than the two others; staminodia 3 or rarely 2, with deformed anthers. Ovary 3-celled or rarely 2-celled; ovules in each of 2 cells 2 superposed, 1 only in the third smaller cell, or ovules 1 in each of 3 cells, or the 3rd cell entirely wanting. Style filiform, with a small stigma. Capsule usually 3-celled, the 2 biovulate cells opening loculicidally, the 3rd uniovulate cell remaining long closed at the back of one of the valves, but sometimes all 3 cells open loculicidally or the 3rd cell is deficient. Seeds smooth or pitted, rugose or reticulate.—Weak herbs, often creeping at the base. Flowers in a complicate oblique leafy bract or spatha, usually 2 or more on a peduncle included in the spatha, with a second peduncle in the same spatha articulate halfway up and bearing a single usually male flower, or reduced to a short barren bristle. Fruiting pedicels recurved so as to ripen the capsule within the spatha.

The genus is widely spread over the warmer regions of both hemispheres, supplying several common weeds of cultivation. The three Australian species may be all endemic, they are very near corresponding Asiatic species to which they have been sometimes referred, but I have been unable to match them precisely.

Spatha not cordate, closed at the base, forming an oblique turbinate inverted cone open at the top only . . . . 1. *C. ensifolia*
Spatha cordate at the base, with rounded auricles closely appressed but not connate.
  Leaves ovate-lanceolate or rarely narrow, contracted above the sheath. Spatha acute, rarely acuminate. Seeds pitted. . . . . 2. *C. cyanea.*
  Leaves very narrow, not contracted above the sheath. Spatha with a long point. Seeds smooth or slightly rugose . . . . 3. *C. lanceolata.*

1. **C. ensifolia,** *R. Br. Prod.* 269.—Glabrous or with a slight pubescence on the leaf-sheaths and a few cilia at the base of the leaves, or rarely a more copious pubescence chiefly on the leaves and spathas. Stems weak, from a procumbent or creeping base ascending to 1 ft. or rather more. Leaves lanceolate, acuminate, mostly 3 to 4 in. long, very narrow or almost linear or rarely more than ½ in. broad, shortly contracted at the base above the membranous often scarious sheath. Spathas usually solitary, sessile or shortly pedunculate, opposite the last leaves, cucullate, very broadly falcate but scarcely acuminate, ¾ to 1 in. long, the closed base 4 to 6 lines long. Each spatha, besides a small rudimentary pedicel, contains a single peduncle shorter than the spatha, bearing 1 to 5 or rarely 6 flowers on pedicels which bear them beyond the spatha, but are recurved within it immediately after flowering. Outer perianth-segments unequal, the largest 3 lines long; inner ones about twice as long, blue, one rather smaller than the other. Stamens 3 perfect, 1 anther larger than the 2 others. Ovary 2- or 3-celled with 1 ovule in each cell. Capsule with 2 dehiscent cells, the 3rd sometimes small, barren, or deficient, sometimes ripening the seed and then dehiscent. Seeds smooth.—F. Muell. Fragm. viii. 60; *C. undulata,* R. Br. Prod. 270.

N. Australia. Islands of the gulf of Carpentaria, *R. Brown, Henne,* and others; Port Essington, *Armstrong;* Port Darwin, *Schultz, n.* 70, 161; Upper Victoria River, *F. Mueller,* Camden Harbour, *Walter;* Central Australia, *M'Dougal Stuart's and Gosse's Expeditions.*

Queensland. From the Maranoa, *Mitchell*, and Peak Downs, *F. Mueller*, over the whole tropical part of the colony to Cape York, *numerous collectors*.
N. S. Wales. Between the Darling and Cooper's Creek, *Neilson*.

Some of the Queensland specimens have broader leaves and 2 spathas at the ends of the stems, but opposed to distinct leaves, and not clustered as they usually are in *C. obliqua*, Don, which is the only Indian species which this one otherwise resembles.

2. **C. cyanea,** *R. Br. Prod.* 269. — Glabrous. Stems weak, creeping and rooting at the base, ascending to 1 or 2 ft. Leaves ovate-lanceolate to narrow-lanceolate, acuminate, mostly 1½ to 3 in. long, very shortly contracted at the base above the sheath. Spathas on short peduncles opposed to the upper leaves, broad, shortly acuminate, deeply cordate at the base with rounded auricles not connate, mostly ¾ to 1 in. long. Peduncles 2, shorter than the spathe below the articulation, but the pedicels protruding beyond it, one peduncle with a single male flower or without any, the others with 2 or rarely 3 flowers on short pedicels. Outer perianth-segments under 3 lines, the inner twice that diameter, those of each series nearly equal. Three perfect anthers, the larger one sagittate, 2 or 3 staminodia. Ovary with 2 ovules in each of 2 cells, 1 only in the third. Capsule with the 2-seeded cells dehiscent, the third usually indehiscent. Seeds without the raised reticulations of *C. communis*, but more or less marked with small scattered pits.—*C. communis*, F. Muell. Fragm. viii. 59, but not exactly the common Asiatic and African *C. communis*, Linn.

N. Australia. Victoria River, *F. Mueller*.
Queensland. Brisbane River, Moreton Bay, *F. Mueller*; Warwick, *Beckler*; Springsure, *Wuth.*; Rockhampton, *Dallachy*, *O'Shanesy*, and others; Rockingham Bay, *Dallachy*, Cape York, *Veitch*.
N. S. Wales. Hunter's River, *R. Brown*, *Oldfield*; Clarence, Hastings, and Macleay Rivers, *Beckler*.

8. **C. lanceolata,** *R. Br. Prod.* 269.—Resembles the slender narrow-leaved forms of *C. cyanea*, but the leaves appear to be always narrow-linear or linear-lanceolate, and the upper ones at least gradually enlarged at the base into a very short sheath without any contraction above it. Spathas narrow and usually produced into a long point, cordate at the base with free rounded auricles. Flowers like those of *C. cyanea*, but one of the outer segments decidedly smaller and narrower than the others, the inner ones nearly equal. Larger anther sagittate, with shorter diverging auricles. Capsules ripening 1 or 2 seeds in each of 2 cells, the 3rd cell remaining small and empty. Seeds smooth or coarsely wrinkled, without the raised reticulations of *C. communis*, or the pitted surface of *C. cyanea*.—*C. agrostophylla*, F. Muell. Fragm. viii. 59.

N. Australia. Sturt's Creek, Albert and Roper Rivers, *F. Mueller*.
Queensland. Bustard Bay, *Banks and Solander*, Port Curtis and Fitzroy Island, *M'Gillivray*. The seeds of these Queensland specimens are rather more rugose than the north-western ones, though otherwise very much like. The character, however,

in all the species of *Commelyna* as derived from the markings of the seed must be taken with great caution, as they can be observed in very few specimens only, and may not be so constant as they have been supposed to be.

3. ANEILEMA, R. Br.

(Aphylax, *Salisb.*, name only.)

Perianth-segments all free, 3 outer ones membranous, concave, slightly imbricate, 3 inner petal-like, obovate, nearly equal. Perfect stamens 3 or sometimes only 2, on one side of the flower; anthers ovate or oblong, the cells opening in longitudinal slits; staminodia 3 or 4 or only 2, with variously shaped imperfect anthers. Ovary 3-celled or rarely 2-celled, with 1 to 5 ovules in each cell superposed in 1 or 2 rows; style subulate, with a small stigma. Capsule oblong ovoid or nearly globular, opening in 3 or rarely 2 valves. Seeds 1 or more in each cell, superposed in a single row, almost cubical, usually rugose.—Weak herbs, with ascending or erect stems. Flowers small, in a loose terminal panicle, singly pedicellate along the branches within a small concave bract, or 2 together within the terminal bract.

The genus is widely spread over the tropical regions of both hemispheres, but more abundant in the Old World than in the New. Of the six Australian species one is widely spread over tropical Asia and eastern Africa, the others as far as hitherto known are endemic.

Filaments all glabrous. Ovary with only 2 perfect cells.
 Stems weak, ascending.
  Leaves ovate-lanceolate. Ovules 3 or 4 in each cell.
   Panicle slender, thyrsoid, usually pedunculate. Capsule oblong . . . . 1. *A. acuminatum.*
   Inflorescence sessile, of 2 short 2-flowered branches. Ovary with a third imperfect cell . . . . . . 2. *A. biflorum.*
  Leaves lanceolate. Ovules 2 in each cell. Capsule as broad as long . . . . 3. *A. sclerocarpum.*
  Leaves linear or narrow-lanceolate. Ovules 1 in each cell. Panicle long and slender.• Flowers small . . . . 4. *A. siliculosum*
Filaments all or some of them bearded. Ovary 3-celled. Stems erect. Radical leaves linear, tufted.
  Filaments all bearded. Panicle irregular, the pedicels distant along the branches . . . . 5. *A. gramineum.*
  Filaments of the perfect stamens bearded, of the staminodia glabrous. Pedicels close together along the branches, leaving a thickened denticulate rhachis . 6. *A. giganteum.*

1. **A. acuminatum,** *R. Br. Prod.* 270.—Stems from a creeping base ascending to 1 ft. or rather more, including the panicle, the whole plant glabrous except minute raised dots, giving a roughness to the leaves and rhachis of the panicle. Leaves ovate-lanceolate, acute, 1½ to 3 in. long, mostly shortly petiolate above the sheath, the upper ones either crowded together or all distant. Panicle slender, thyrsoid, often 3 to 6 in. long or even more, usually pedunculate above the last leaves, or rarely with smaller leaves close under it; branches simple, filiform, singly or rarely in pairs along the rhachis, the bracts under the branches very small and lanceolate. Pedicels filiform, 2 to 4 lines long,

singly scattered along the branches within broad cucullate bracts under ½ line long, or 2 together within the uppermost bracts. Outer perianth-segments oblong, 1½ lines long, inner ones twice as long, almost orbicular. Filaments all glabrous, 2 or rarely 3 with perfect anthers, 1, 2 or rarely 3 with abortive anthers. Ovary 2-celled, with 3 or 4 (sometimes 5 ?) ovules in each cell. Capsule oblong, very obtuse, much flattened, longer than the perianth. Seeds irregularly tuberculate-rugose.—*A. laxum*, R. Br. Prod. 270; *A. siliculosum*, F. Muell. Fragm. viii. 61, not of R. Br.

Queensland. Endeavour River and Bustard Bay, *Banks and Solander*; Moreton Bay, *F. Mueller*, *Backhouse* and others; Rockhampton, *O'Shanesy*, *Bowman*, and others; Rockingham Bay, *Dallachy*.

N. S. Wales. Grose River, *R. Brown*; Macleay and Hastings Rivers, *Beckler*; Tweed River, *C. Moore*; New England, *C. Stuart*.

2. **A. biflorum,** *R. Br. Prod.* 270.—Stems very slender, creeping and loosely branched at the base, the flowering branches ascending to 6 or 8 in. Leaves ovate-lanceolate, acute, distinctly petiolate above the sheath, mostly 1 to 1½ in. long. Inflorescence sessile within the last leaf and rarely exceeding it, consisting usually of 2 short branches, each bearing 2 flowers within a small cucullate bract, without any bracts below it. Flowers rather smaller than in *A. acuminatum*. Perianth of that species. Filaments all glabrous, 3 with rather large anthers, 3 much shorter with small imperfect anthers. Ovary with 2 perfect cells containing usually 3 superposed ovules in each and a third smaller cell without perfect ovules. Capsule only seen unripe, not so flat as in *A. acuminatum*.

Queensland. Brisbane River, *Bailey*.

N. S. Wales, *R. Brown*; New England, *C. Stuart*.

3. **A. sclerocarpum,** *F. Muell. Fragm.* viii. 61.—Stems weak, branching, ascending to about 1 ft., with the minute scabrous dotting of *A. acuminatum*. Leaves lanceolate, acute, tapering into a short petiole above the sheath, mostly 1½ to 2 in. long. Panicle short, but loose and slender, sessile above the last leaf, with few rather long filiform branches, each bearing several flowers on filiform pedicels of 2 to 4 lines, solitary and distant along the branches but always 2 together within the last bract. Bracts very small and scarious except sometimes under the lowest 1 or 2 branches. Outer perianth-segments ovate, obtuse, about 1½ lines long, inner ones longer. Filaments all glabrous, 3 with perfect anthers, 3 with abortive ones. Ovary 2-celled with 2 superposed ovules in each cell and no rudiment of the third cell. Capsule as broad as long and rather shorter than the perianth, the pericarp rather more rigid and darker coloured than in *A. acuminatum*. Seeds tuberculate-rugose.

Queensland. Herbert's Creek, *Bowman*.

4. **A. siliculosum,** *R. Prod.* 270.—Quite smooth and glabrous

except a slight pubescence on the rhachis of the inflorescence. Stem weak, branched and leafy, probably tall or long but the lower part unknown. Leaves broadly linear or almost lanceolate, broad and stem-clasping at the base but scarcely forming a distinct sheath, except perhaps the lower ones, tapering to a point, the largest in our specimens 6 to 7 in. long and 4 to 6 lines broad below the middle. Panicle slender, thyrsoid and at length 6 in. long or even more as in *A. acuminatum*, but the flowers much smaller, the branches filiform with 2 or 3 flowers in each on filiform pedicels. Bracts very small. Outer perianth-segments 1 to 1¼ lines long, the inner scarcely 2 lines. Filaments all glabrous, 3 with perfect anthers, 3 with small abortive ones. Ovary 2-celled, with 1 ovule in each cell. Capsule very obtuse, rather longer than the perianth. Seeds 1 in each cell, oblong, transversely rugose.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown.*
Queensland. Cape York, *M'Gillivray.*

The above description was taken from M'Gillivray's very good specimens, in R. Brown's the branches of the panicle are longer with a few empty bracts below those subtending the pedicels. I could not verify the internal structure of the ovary, but to all appearance it was as in M'Gillivray's. The species is evidently quite distinct from *A. acuminatum.*

5. **A. gramineum,** *R. Br. Prod.* 270.—Rarely quite glabrous, usually with a scabrous pubescence at least on the leaf-sheaths and some long hairs or cilia on the margins of the sheaths and base of the leaves. Fibrous roots often much thickened, almost tuberous. Radical leaves tufted, grass-like, with short broad sheaths, mostly 3 or 4 in. long, but in very luxuriant specimens at least twice that length, varying from 3 or 4 lines broad and tapering to a long point to very narrow almost subulate. Stems erect, 6 in. to nearly 2 ft. high, with few long leaves dilated into short sheaths. Panicle very irregularly and loosely branched, rarely much longer than broad, often forked at the base but the branches otherwise simple, long or short, on a flexuose rhachis, the pedicels rather distant along the branches with a scarious bract under each. Outer perianth-segments varying from under 3 lines to nearly 4 lines, the inner ones longer, usually pale blue and much veined, but in some specimens appearing of a different colour without conspicuous veins. Filaments all bearded, 3 with perfect anthers, 3 with small abortive ones. Ovary 3-celled, with 4 or 5 ovules in each cell. Capsule oblong or ovoid, rather longer than the perianth. Seeds pitted-rugose.—F. Muell. Fragm. viii. 62.

N. Australia. North coast and islands of the Gulf of Carpentaria, *R. Brown*; Victoria River and Sea Range, *F. Mueller*; Port Darwin, *Schultz*, n. 88.

Queensland. Broad Sound, *R. Brown*; Brisbane River, Moreton Bay, *A. Cunningham*, *F. Mueller*, and others; Peak Downs and Mackenzie River, *F. Mueller*; Rockhampton, *Bowman*, *O'Shanesy*, and others; Port Curtis, *M'Gillivray*; Keppel Bay, *Thozet*; Rockingham Bay, *Dalachy.*

N. S. Wales. Hunter's River. *R. Brown*; Clarence River. *Beckler*; Richmond River, *Woolls*; New England, *C. Stuart*, *C. Moore.*

Most of the N. S. Wales specimens and a few of the Queensland ones have broader leaves and larger flowers than Brown's typical ones from Hunter's River and Broad Sound. Brown's *A. affine* (Prod. 271) from the north coast is a variety with narrow leaves, slender panicles, and the capsule 4 to 5 lines long. *A. anthericoides*, Br. l. c. 271, from the islands of the Gulf of Carpentaria, is intermediate between that and the typical form.

6. **A. giganteum,** *R. Br. Prod.* 271.—Quite glabrous. Fibrous roots much thickened, almost tuberous. Radical leaves tufted, linear or linear-lanceolate, with short broad sheaths, 6 in. to 1 ft. long or even more, tapering to a fine point. Stems erect from amongst or by the side of the leaf-tufts, 1 to 2 ft. high or more in some Indian specimens, with few shorter leaves dilated into rather long sheaths, the uppermost under the first branch of the inflorescence reduced to a sheathing bract. Panicle simple or forked at the base, each branch bearing 2 to 6 unilateral racemes scorpioid when young, the lowest on a long peduncle the uppermost almost sessile on the common rhachis. Pedicels close above one another, the bracts reduced to a small tooth, leaving in the old racemes a thickened closely denticulate rhachis. Outer perianth-segments thin and somewhat coloured, 3 lines long or rather more, inner ones larger, of a deep blue. Perfect stamens 3 with bearded filaments and rather large anthers; staminodes 3 with shorter glabrous filaments. Ovary 3-celled, with 2 ovules in each cell. Capsule acute or acuminate, rarely almost obtuse, about as long as the perianth. Seeds finely and not deeply sculptured. — *Commelyna gigantea*, Vahl, Enum. ii. 177; *Aneilema longifolia*, Hook. Exot. Fl. t. 204; *A. ensifolium* and *A. secundum*, Wight, Ic. t. 2074, 2075; *A. nudiflorum*, F. Muell. Fragm. viii. 62, not of R. Br.

N. Australia. Islands off the N. coast, *R. Brown;* Port Darwin, *Schultz*, n. 642.

Queensland. Cape York, *Veitch;* Cape York Peninsula, *Hann's Expedition.*

Var. *gracilis*, very slender, with smaller and fewer flowers.

Queensland. Rockingham Bay, common in long grass, *Dallachy.*

The species appears to be widely spread in East India from Ceylon and the Peninsula to the Malayan Archipelago and in E. tropical Africa. It is easily recognised by the closely denticulate rhachis of the racemes, well indicated by Vahl but omitted by Kunth in his transcription of Vahl's diagnosis. *A. nudiflorum*, R. Br., has a nearly similar rhachis but much smaller flowers with some other differences. The flowers in *A. giganteum* are variable, largest in a few Indian specimens, rather smaller in the African and Australian ones, especially in the above-mentioned var. *gracilis*. In Wight's figure of *A. ensifolium*, the staminodia are represented with bearded filaments as well as the perfect stamens, but that is evidently an error of the artist, who has also in all the *Aneilemas* figured the staminodia as alternating with the perfect stamens instead of each being collected on one side.

4. FLOSCOPA, Lour.

(Dithyrocarpus, *Kunth.*)

Perianth-segments all free, 3 outer ones membranous, concave, imbricate, 3 inner large, petal-like, one rather narrower than the others, Stamens 6, all perfect; anther-cells opening in longitudinal slits.

Ovary contracted at the base or shortly stipitate, 2-celled with 1 ovule in each cell; style subulate, with a small terminal stigma. Capsule shortly stipitate, compressed, didymous, opening in 2 valves. Seeds solitary in each cell, laterally attached.—Erect or ascending herbs, usually creeping at the base. Flowers small, pedicellate and racemose along the branches of a dense terminal panicle.

The genus is extensively dispersed over the tropical regions of the New as well as the Old World, and consists of but very few species, the majority of those published being reducible to the single Australian one which extends over the whole area of the genus.

1. **F. paniculata,** *Hassk. Pl. Jungh.* 151.—Stems ascending to 1 or 2 ft., usually glabrous. Leaves lanceolate or ovate-lanceolate, acuminate, 2 to 4 in. long, scabrous on the upper side, the sheath fringed with long hairs, at least at the top. Flowers small, in a dense terminal ovate or broad hirsute panicle, 1½ to 2 in. long, sometimes leafy at the base, the branches simple or the lower ones forked. Outer perianth-segments very hairy, 1 line long or rather more, inner ones but little longer, bright blue. Stamens exserted.—*Tradescantia paniculata*, Roxb. Corom. Pl. t. 109; also the several *Dithyrocarpi* figured by Wight, Ic. t. 2079 and 2080, or described by Kunth, Enum. iv. 78 and 79, and other synonyms, quoted in Benth. Fl.Hongk. 377.

Queensland. Rockingham Bay, common, *Dallachy*; Daintree River, *Fitzalan*. Widely diffused over tropical Asia, Africa, and Brazil.

5. POLLIA, Thunb.

(Aclisia, *E. Mey.* Lamprocarpus, *Blume.*)

Perianth-segments all free, 3 outer ones membranous, thin, very broad and much imbricate, 3 inner petal-like, obovate, nearly equal. Stamens 6, somewhat declinate, all perfect or the 3 upper ones reduced to staminodia with small empty anthers; perfect anthers ovate, emarginate at the base, the cells opening in longitudinal slits. Ovary 3-celled, with several ovules in each cell superposed in 2 rows; style subulate, with a small stigma. Fruit ovoid or globular, usually blue and shining, indehiscent but dry with a brittle pericarp. Seeds angular, with a brown testa.—Tall perennials, usually weak and creeping at the base. Leaves large. Flowers in terminal thyrsoid panicles, the primary branches often forming clusters almost whorled. Bracts all shorter than the flowers.

The genus extends over tropical and eastern subtropical Asia. Of the two Australian species one is endemic, the other reaches the Salomon Islands.

Margin of the leaf-sheaths and leaves quite entire. Branches of the oblong panicle in distinct clusters or whorls . .	1. *P. macrophylla.*
Margin of the leaf-sheaths and base of the petiole undulate-crisped. Branches of the short sessile panicle densely crowded	2. *P. crispata.*

1. **P. macrophylla,** *Benth.*—Quite glabrous. Stems creeping and rooting at the lower joints, ascending or erect to the height of several feet. Leaves broadly lanceolate, acuminate, mostly 6 to 8 in. long, tapering into a short petiole above the sheath, the margin not at all waved, the sheath loosely cylindrical, ½ to 1 in. long, the orifice oblique and quite entire, the uppermost leaf usually sessile and stem-clasping almost without any sheath. Panicle shortly pedunculate above the last leaf, oblong, 3 to 4 in. long, the branches collected in distinct clusters almost verticillate, each branch rarely above ½ in. long, bearing several flowers on short slender pedicels. Bracts lanceolate and leafy under the lowest clusters of branches, small, very broad, obtuse and thin under the pedicels. Outer perianth-segments scarcely 2 lines long, inner ones rather longer, recorded generally as blue, but in one instance said to be white. Perfect stamens 3, the 3 others reduced to staminodia. Fruit ovoid, rather narrow, usually about 3 lines long. —*Aneilema macrophyllum*, R. Br. Prod. 270.

Queensland. Northumberland Islands, *R. Brown;* Brisbane River, *F. Mueller;* Rockingham Bay, *Dallachy;* Fitzroy River, *O'Shanesy;* Port Denison, *Fitzalan.* The species is also in the Salomon Islands.

F. Muell. Fragm. v. 40, unites this and the following species under the name of *P. cyanococca.* This specific name is quite as applicable to the whole genus as Brown's original one *macrophylla.*

2. **P. crispata,** *Benth.*—A weak ascending perennial, rooting at the base. Leaves lanceolate, acuminate, 4 to 6 in. long, tapering at the base, the very short petiole and orifice of the sheaths undulate-crisped, almost denticulate, the sheath loosely cylindrical, ½ to 1 in. long; the uppermost leaves crowded and smaller. Panicle closely sessile within the last leaves, rarely 2 in. long, the crowded branches attaining at length 1 to 2 in. Flowers rather numerous, rather larger than in *P. macrophylla.* Stamens as in that species. Fruit ovoid, about 3 lines long.—*Aneilema crispata*, R.Br. Prod. 270; Bauer, Illustr. Fl. Nov. Holl. t. 6.

Queensland. Moreton Bay, *F. Mueller, Eaves.*
N. S. Wales. Williams River, *R. Brown;* Hastings River, *A. Cunningham, Beckler;* Clarence River, *Wilcox;* Richmond River, *Henderson;* New England, *C. Stuart;* and southward to Illawarra, *A. Cunningham.*

6. CARTONEMA, R. Br.

Perianth-segments all free, 3 outer ones herbaceous, lanceolate, 3 inner very broad, petal-like, sessile, withering after flowering but persistent. Stamens 6, nearly equal; anthers oblong or rarely short, opening in terminal pores at length continued into lateral slits. Ovary 3-celled, with 2 superposed ovules in each cell. Style filiform, with a small terminal pedicellate stigma. Capsule 3-valved.—Herbs with leafy stems, simple or branched at the base. Leaves narrow. Flowers in simple terminal spikes or racemes, solitary within small or narrow bracts.

The genus is limited to Australia, the four species regarded by some botanists as varieties of a single one.

Spikes dense. Outer perianth segments 8 to 9 lines long. Filaments broad and thin. Anthers narrow, oblong . . . . 1. *C. philydroides.*
Spikes dense. Outer perianth-segments 6 to 7 lines long. Filaments narrow. Anthers narrow, oblong . 2. *C. spicatum.*
Spikes elongated the flowers all distant. Outer perianth-segments 3 to 4 lines long. Filaments shorter than the anthers . . . . 3. *C. parviflorum.*
Spikes dense. Outer perianth-segments 3 to 4 lines long. Anthers ovate, much shorter than the filaments . . . . 4. *C. brachyantherum.*

1. **C. philydroides,** *F. Muell. Fragm.* i. 62.—A tall species, much resembling Bauer's figure of *C. spicatum* in general habit. Stems very leafy, from 6 in. to above 1 ft. high, pubescent as well as the leaves which are otherwise those of *C. spicatum.* Spikes dense, 3 to 4 in. long. Outer perianth-segments lanceolate, subulate-acuminate, 8 to 9 lines long, inner segments about as long, not at all spotted. Filaments very broad, thin, and hyaline; anthers narrow-oblong, the cells opening in lateral slits to the base. Capsule rather obtuse, sprinkled with a few hairs.—*C. spicatum,* Endl. in Pl. Preiss. ii. 55.

W. Australia. King George's Sound to Swan River, apparently abundant, *Drummond*, *Preiss*, *n.* 2228.

2. **C. spicatum,** *R. Br. Prod.* 271, *partly.*—Stems branching at the base, usually hairy, rarely 6 in. high below the spike. Leaves linear, tapering from a base of 1½ to 3 lines broad just above the sheath to a long point, the longer ones usually exceeding the spike. Spikes 1 to 3, sometimes very compact and only 2 in. long, rarely elongated to 6 in., and rather loose. Bracts linear-subulate, shorter than the perianth. Outer perianth-segments subulate-acuminate, 5 to 6 lines long, very hairy; inner segments obovate, nearly as long, often but not always spotted. Filaments slightly flattened, at first shorter but at length rather longer than the oblong-linear anthers, which open in terminal pores rarely splitting down the sides of the cells. Ovary and capsule glabrous.—Kunth, Enum. iv. 115; Bauer, Illustr. Fl. Nov. Holl. t. 7.

N. Australia. Arnhem S. Bay, *R. Brown*; North Goulburn Island, *A. Cunningham*; Escape Cliffs, *Hulse*; Port Darwin, *Schultz*, *n.* 25.

3. **C. parviflorum,** *Hassk. in Flora,* 1869, 365.—Less hairy than *C. spicatum,* and taller, chiefly from the length of the spike, the leaves very long and narrow. Spike loose from the first with the flowers all distant and often lengthening to 1 ft. or even more. Outer perianth-segments 3 to 4 lines long, inner ones usually more or less dotted.

Filaments very short, anthers oblong, the cells opening in some specimens in terminal pores only, in others the slit extending to the base. Capsule small, glabrous.

N. Australia. Islands of the north coast, *R. Brown;* Victoria River, *F. Mueller;* north-west coast, *Bynoe;* Glenelg district, *Martin;* Port Darwin, *Schultz, n.* 280; Liverpool River, *Gulliver.*

This was included by Brown in his *C. spicatum*, both forms bear in his herbarium the specific name of *villosa*, which was, however, never published.

4. **C. brachyantherum,** *Benth.*—A dwarf plant, the stems not above 1 to 2 in. high below the spike, the leaves mostly exceeding the spikes. Spikes about 1½ in. long, dense and hairy as in *C. spicatum*, but the flowers very much smaller, like those of *C. parviflorum*, and the anthers different from those of all other species, being shorter than broad, the cells opening laterally to the base. Capsule glabrous.

Queensland. Port Denison, *Fitzalan.*

ORDER CXXXII. JUNCACEÆ.

Flowers hermaphrodite or diœcious. Perianth inferior, persistent, with or without a distinct tube, the limb or perianth of 6 lobes or segments imbricate in 2 series or the outer ones rarely valvate, all or at least the outer ones, or in diœcious species, at least the females glume-like or rigid, or scarious thin and almost hyaline, the inner ones rarely somewhat petal-like. Stamens usually 6, attached to the base of the lobes or segments or almost hypogynous, the 3 opposite the inner segments deficient in a few species; filaments free; anthers erect or versatile, with 2 parallel cells opening laterally or inwards in longitudinal slits. Ovary superior, 3-celled or if 1-celled with 3 parietal or basal placentæ, with 1 or several ovules to each cell or placenta, anatropous or amphitropous. Style either single with a small terminal stigma, or short and more or less deeply divided into 3 oblong or subulate recurved stigmatic branches. Fruit a capsule, opening loculicidally in 3 valves, or rarely owing to the splitting of the valves 6-valved. Seeds erect or laterally attached, ovoid globular angular or rarely flattened, the testa appressed, rarely black and not shining. Embryo small and basal, rarely linear and transverse, in a hard or fleshy rarely almost mealy albumen.—Perennial or rarely annual rigid herbs, with a short or tuberous or creeping rhizome, or the stock growing up into a woody caudex rarely almost arborescent. Flowering stems or scapes leafless or nearly so except at the base, or branching and leafy and then usually slender and covered by the leaf-sheaths. Leaves mostly radical narrow grass like or rigid with fine parallel veins. Flowers small (except in Calectasieæ), green brown or whitish, very rarely blue, often densely clustered with small imbricate scarious bracts, the single flowers or clusters solitary and terminal or in terminal panicles.

The two typical genera of this somewhat heterogeneous order are amongst the most generally spread, especially in extratropical and subtropical regions, the remaining genera here enumerated, forming the first three anomalous tribes, are limited to Australia with the exception of a single species found also in New Caledonia. The order comprises also a very few anomalous genera from other parts of the world not found in Australia. As a whole it is very nearly allied to *Liliaceæ*, to which some of the genera here included have been occasionally referred, according as the greatest weight has been attached to the distinctive characters derived from the perianth the seed or the habit. Each of the following tribes has been regarded by some botanists as a distinct order, or the first three have been united with a few extra-Australian genera as an intermediate Order between *Liliaceæ* and *Juncaceæ* without however any common definite distinctive character.

Tribe I. **Xeroteæ.** *Perianth small, usually dry, scarious, or hyaline, at least in the females, rarely almost petal-like. Anthers versatile, attached at the back between the basal lobes. Ovary 3-celled, with 1 laterally attached ovule in each cell.*

Flowers diœcious. Style short with 3 recurved branches.
  Leaves in radical tufts or along short leafy stems, not fringed above the sheath . . . . 1. Xerotes.
Flowers hermaphrodite. Style subulate, with a small terminal stigma.
  Capsule smooth. Leaves in radical tufts bordered when young by a scarious lacerated margin . . . . 2. Chamæxeros.
  Capsule muricate. Leaves along short leafy stems . . 3. Acanthocarpus.

Tribe II. **Xanthorrheæ.** *Outer perianth glume-like, inner thin and scarious or petal-like, the flowers usually small. Anthers entire at both ends, versatile, dorsally attached about the middle. Style subulate with a small terminal stigma. Caudex either very short, thick, and hard, or elongated and woody.*

Perianth-segments all free. Ovary 3-celled, with few ovules in each cell. Flowers in long dense cylindrical spikes, on a long scape or peduncle . . . . . 4. Xanthorrhæa.
Outer perianth-segments united in a tube. Ovary 1-celled, with 3 (often only 1 perfect) ovules erect from a basal placenta. Flowers in globular heads on a terminal peduncle . . . . 5. Dasypogon.

Tribe III. **Calectasieæ.** *Perianth-segments all rigid, sometimes coloured. Anthers erect. Style subulate, with a small terminal stigma. Flowers rather large.*

Perianth segments erect and distinct from the base. Ovary 3-celled with 1 erect ovule in each cell.
  Stamens exserted. Caudex long and woody. Flowers in globular heads on terminal peduncles enclosed in many sheathing bracts . . . . 6. Kingia.
  Stamens included. Flowers long and solitary within a tuft of rigid radical leaves . . . . 7. Baxteria.
Perianth hypocrateriform, usually blue, with a cylindrical tube. Ovary 1-celled with 3 erect central ovules. Flowers solitary on the short branches of leafy stems 8. Calectasia.

Tribe IV. **Eujunceæ.** *Perianth small, the segments all free and glume-like. Anthers erect. Style with 3 linear stigmatic branches. Leaves grass-like or terete, mostly radical or none.*

Ovary 1-celled, with 3 erect ovules . . . . 9. Luzula.
Ovary 1-celled, or more or less perfectly 3-celled, with several often many ovules to each placenta . . . 10. Juncus.

Tribe I. **Xeroteæ.** Perianth small, usually dry scarious or hyaline at least in the females, rarely almost petal-like. Anthers versatile, attached at the back between the basal lobes. Ovary 3-celled, with 1 laterally attached ovule in each cell.

1. XEROTES, Banks.

Flowers diœcious. Males: Perianth of 6 segments or lobes all equal and similar, free or united to the middle, or more frequently the 3 outer free from the base thin and hyaline or scarious, the 3 inner more petal-like and more united at the base. Stamens 6, 3 attached to the base or centre of the 3 inner segments or lobes, 3 alternating with them, all shorter than the perianth; anthers versatile, usually deeply lobed below their attachment and sometimes at the apex also, the cells then quite distinct and dorsally attached, opening in longitudinal slits. Ovary rudimentary or entirely deficient. Female fl.: Perianth persistent, usually of a firmer consistence than in the males, of 6 equal and similar segments. Stamens none or reduced to small clavate staminodia. Ovary sessile, 3-celled, with 1 (or rarely 2?) erect ovules laterally attached in each cell; style very short or scarcely any, with 3 recurved stigmatic lobes. Capsule nearly globular, surrounded by the persistent perianth, coriaceous, smooth and shining or transversely wrinkled or rarely longitudinally striate, opening loculicidally in 3 valves. Seeds ovoid globular or somewhat angular when all three ripen; testa thin, adnate, not black; albumen rather hard; embryo linear or very short, erect from the base of the seed.—Stems tufted on a very short or creeping rhizome or stock, either densely leafy at the base only or slender elongated and leafy. Scapes or peduncles either very short or the inflorescence sessile in the tufts of radical leaves or at the ends of the leafy stems or more or less elongated below the inflorescence. Flowers small, the males usually either in dense clusters or solitary along the branches of a panicle, sessile or pedicellate within short scarious bracts; the female inflorescences either similar to the males or less branched or reduced to single sessile globular heads, or rarely both sexes in dense globular or oblong heads along a simple rhachis or connected into a long dense cylindrical spike.

The genus is nearly limited to Australia, one species only being also found in New Caledonia. Some of the wide-spread species are very variable and difficult to define, and the difficulty is often much increased by the extreme rarity of female specimens in collections; and when present, the uncertainty of their being correctly matched, the difference in habit, especially in inflorescence, between the two sexes being sometimes very striking. In R. Brown's herbarium, the labels are unfortunately not corrected according to the Prodromus as in most other genera, and by some clerical error the wrong letters indicative of stations have been affixed to some of the diagnoses in that work. There are, however, numbers or other indications in the herbarium, which, with the aid of diagnoses, have enabled me to identify the whole of the species with tolerable certainty.

Sect. I. **Euxerotes.**—*Male flowers paniculate or racemose or clustered along a simple or branched rhachis. Female inflorescence similar or more simple. Perianth-segments free from the base in both sexes or in the males the inner ones only shortly united. Leaves densely crowded or tufted on the very short or slightly elongated leafy stem (except in X. pauciflora). Scapes or peduncles terminal.*

SERIES I. **Glomeratæ.**—*Male flowers sessile and numerous in sessile clusters. Capsules smooth or nearly so.*

Three of the stamens attached to the centre of the inner perianth-segments. Bracts obtuse and short.
Perianth about 1½ lines long, all the segments free from the base, thin and broad . . . . 1. X. *Banksii.*
Perianth about 1 line long, the inner segments connate to near the middle . . . . 2. X. *dura.*
Stamens all attached to the base of the segments.
Bracts, at least the lower ones, with subulate points usually exceeding the flowers. Leaves often rigidly 2-toothed at the apex. Eastern species . . . . . 3. X. *longiflora.*
Bracts scarious, obtuse, or very rarely with short points. Western species.
Leaves flat, 2 or more lines broad.
Leaves thick and rigid, under 1 ft. mostly 2-toothed at the end. Male scapes from the lower axils . 4. X. *rigida.*
Leaves above 1 ft. long, entire. Female scapes terminal, very short . . . . 5. X. *Drummondii.*
Leaves thick or terete, under 1 line broad.
Leaves rather thick. Scapes above 6 in. long . . 6. X. *Sonderi.*
Leaves filiform. Scapes under 4 in. long . . . . 7. X. *odora.*

SERIES II. **Fasciculatæ.**—*Male flowers numerous in sessile clusters (irregular in X. sororia), but on pedicels exceeding the bracts.*

Capsule transversely rugose. Eastern species.
Flowers numerous, in distinct clusters along the branches of the panicle or along a simple rhachis . . . . . 8. X. *multiflora.*
Flowers all erect and irregularly clustered in a small narrow compact panicle . . . . 9. X. *sororia.*
Capsule smooth. Western species.
Leaves glabrous, narrow linear or filiform. Male flowers in distinct clusters; perianth-segments pale with dark centres . . . . 10. X. *Endlicheri.*
Leaves hairy on the back at least at the base . . . . 11. X. *sericea.*
Leaves glabrous, flat, above 1 line broad, with thickened margins.
Male flowers dark purple in distinct clusters or rarely in a single terminal head . . . . 12. X. *purpurea.*
Male flowers pale coloured in small clusters, all contiguous or nearly so in a terminal spike . . . . 13. X. *Preissii.*

SERIES III.—**Sparsifloræ.**—*Male flowers pedicellate or rarely sessile, singly scattered in simple racemes or loose panicles, rarely here and there 2 or 3 together.*

Panicles loose (usually on very short scapes). Perianth-segments all similar, usually narrow or acuminate.
Hyaline bracts very prominent. Perianth-segments nearly 2 lines long . . . . 14. X. *effusa.*
Bracts minute. Perianth-segments scarcely 1 line long . 15. X. *micrantha.*
Panicles less branched or reduced to simple racemes. Inner perianth-segments thicker than the outer, usually ovate or broad.
Leafy base of the stems short and tufted.
Flowers pedicellate, in a narrow loose panicle or simple raceme. Eastern species . . . . 16. X. *filiformis.*
Flowers sessile, in a simple interrupted spike. Western species . . . . 17. X. *cæspitosa.*
Leafy stems slender, elongated. Leaves filiform. Racemes few-flowered. Western species . . . . 18. X. *pauciflora.*

SECT. II. **Cephalogyne.**—*Male flowers sessile in sessile or rarely pedunculate clusters or heads usually several on a common rhachis, the perianth divided to the middle only into*

6 equal lobes. Female flowers sessile in solitary sessile or very shortly pedunculate heads, the perianth divided to the base into 6 equal segments. Leafy stems often elongated, especially in the females, the scapes or peduncles terminal or in the upper axils.

Male flowers under 1 line or scarcely longer in several often numerous clusters.
  Leafy stems elongated, with short twisted leaves. Female perianths rather rigid in globular sessile heads . . 19. *X. flexifolia.*
  Leafy stems often elongated with scarcely twisted leaves more than 2 in. long. Female flowers of *X. flexifolia* 20. *X. glauca.*
  Leafy base of the stems very short. Leaves above 1 ft. long. Female heads very scarious on very short peduncles.
    Sheathing bases of the leaves with scarious margins splitting into numerous filaments. Eastern species. 21. *X. elongata.*
    Sheathing bases of the leaves not splitting into filaments. Western species . . . . 22. *X. rupestris.*
  Leafy base of the stems often several inches long. Leaves ½ to 1 ft., the sheathing base splitting into filaments. Female heads scarious. Western species . . . . 23. *X. collina.*
Male flowers often 2 lines long in single or few heads. Leafy base of the stems very short . . . . 24. *X. suaveolens.*
Male flowers unknown. Female perianths (perhaps not normal) split into masses of hair-like segments . . . 25. *X. turbinata.*

SECT. III. **Schœnoxeros.**—*Barren stems rushlike, leafless except sheathing scales at the base. Flowering scapes very short and leafless, with 2 or 3 flowerheads, males and females nearly similar.*

Bracts scarious, entire. Western species . . . . . . 26. *X spartea.*
Bracts fringed or slit into hairs. S. Australian species . . 27. *X. juncea.*

SECT. IV. **Typhopsis.**—*Flower-heads or spikes globular or cylindrical, very dense, the bracts split into dense masses of woolly hairs, males and females similar.*

Leafy base of the stem very short. Leaves 1 to 2 ft. long . 28. *X. leucocephala.*

SECT. V. **Macrostachya.**—*Flower-clusters closely arranged in a long terminal cylindrical spike with scarious bracts, males and females similar.*

Leafy base of the stems very short. Leaves 2 to 3 ft. long 29. *X. hastilis.*

SECTION I. EUXEROTES.—Male flowers paniculate or racemose or clustered along a simple or branched rhachis. Female inflorescence similar or more simple. Perianth-segments free from the base in both sexes, or in the males the inner ones only shortly united. Leaves densely crowded or tufted on the very short or slightly elongated leafy stem (except in *X. pauciflora*). Scapes or peduncles terminal.

SERIES I. GLOMERATÆ.—Male flowers sessile and numerous in sessile clusters. Capsule smooth or nearly so.

1. **X. Banksii,** *R. Br. Prod.* 263.—Leafy base of the stem often lengthening to 5 or 6 in., rather thick, densely covered with the sheathing bases of the leaves. Leaves distichous, spreading, mostly under 1 ft. long and about 3 lines broad, the sheathing bases with narrow scarious margins. Scapes stout, not long below the inflorescence. Male flowers forming a panicle of 8 in. to 1 ft. with long spreading open clustered branches, the flowers sessile in globular clusters sessile along the branches and at their base. Bracts numerous, hyaline, much shorter than the perianths. Perianth-segments all equal, ovate, thin,

hyaline, about 1½ lines long when fully out. Stamens 3 attached to the centre of the inner segments, 3 at their base alternating with them. Ovary usually present and not much shorter than the perianth, but narrow with imperfect stigmas and abortive ovules. Female inflorescence only seen in fruit, either quite simple with dense globular clusters of numerous flowers, or with a short branch bearing a small cluster proceeding from the lowest cluster. Capsule about 3 lines diameter, smooth or scarcely wrinkled.

Queensland. Endeavour River, *Banks and Solander*; Cooktown, *Fitzalan*; Cape York Peninsula, *Hann's Expedition*; Cape York, *Daemel*; frequent in islands off the coast, *C. Moore*; and apparently the same species, New Caledonia, *Vieillard* and others.

2. **X. dura,** *F. Muell. in Trans. Vict. Inst.* 1855, 42; *Fragm.* viii. 207.—Leafy base of the stem very short. Leaves 1 to 2 ft. long, mostly about 2 lines broad, rigid, flat or convex underneath, the sheathing base scarious on the margin. Scape short, thick, slightly flattened. Panicles both male and female much branched and very rigid, with small bracts and small flowers sessile or nearly so in numerous clusters at and along the ramifications. Male perianth campanulate, about 1 line long, the outer segments thin, ovate, obtuse, free from the base, the inner ones as long, but more petal-like and united at least to ⅓ of their length. Stamens with very short filaments, 3 attached to the centre of the inner lobes, 3 alternating with them at the top of the tube. No rudiment of the ovary. Female perianth-segments all nearly similar and free from the base. Capsule nearly globular, smooth, about 2 lines diameter.

S. Australia. Lofty ranges, *F. Mueller*; in the interior, *M'Dougal Stuart.*

3. **X. longifolia,** *R. Br. Prod.* 262.—Leafy base of the stems very short and tufted. Leaves radical or nearly so, 1 to 2 ft. long, flat or slightly concave, varying from 1 to 3 lines in width, rather rigid, mostly 2-toothed at the apex, with a short membranous sheathing base. Scape from under 1 ft. to nearly 2 ft. high including the inflorescence, much flattened below the panicle, which is sometimes almost reduced to a short and few-flowered interrupted spike, but more frequently pyramidal with numerous more or less clustered spreading branches, the whole inflorescence from 6 in. to nearly 1 ft. long. Flowers small, sessile and numerous in dense clusters sessile along the rhachis at the base and ends of the branches, the clusters more numerous in the males than in the females. Bracts under the clusters shortly broad at the base, usually with long rigid subulate points, sometimes all far exceeding the flowers, sometimes nearly all short except under the lowest clusters. Bracts or bracteoles subtending or enclosing the flowers broad and hyaline, shorter than the perianths, often very numerous in the females, fewer or united into one under each flower in the males. Perianth varying from 1 to nearly 2 lines in length, usually but not always larger in the females than in the males, the 3 outer segments

quite free, much imbricate, rigid and scarious though often very thin, the 3 inner more petal-like and obtuse but not longer, shortly united at the base in the males. Filaments short, dilated at the base, attached to the base of the inner perianth. Male flowers usually without any rudimentary ovary. Capsule shortly protruding from the persistent perianth, ovoid or almost globular, 2 to 3 lines diameter, hard, smooth and shining.—Hook. f. Fl. Tasm. ii. 63; F. Muell. Fragm. viii. 210; Bot. Reg. 1839, t. 3; *Lomandra longifolia*, Labill. Pl. Nov. Holl, i. 92, t. 119.

Queensland. Broad Sound and Thirsty Sound, *R. Brown;* from Moreton Bay, *F. Mueller* and others, to Rockhampton, *O'Shanesy;* Rockingham Bay, *Dallachy;* Burdekin River, *F. Mueller*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and many others; very abundant in the northern districts, *Fraser, C. Stuart, Beckler*, and many others; in the interior to the Darling and Barcoo Rivers, *Fraser, Neilson*.

Victoria. Emu Creek, *Robertson*, common about Melbourne and along the Yarra, *Adamson, F. Mueller* and others, ascending on Mount Barklay to 5000 ft., *F. Mueller*.

Tasmania. *R. Brown;* abundant on dry and moist ground throughout the colony, *J. D. Hooker*.

South Australia. Rivoli Bay, *F. Mueller*.

This species varies like others in the length and breadth of the leaves, but much more conspicuously in the size and ramification of the panicle, in the colour of the perianth when dry from brown and shining to colourless and almost hyaline, and according to collectors when fresh from a golden yellow to black or yellowish white, and especially in the number and length of the prominent subulate bracts. When the specimens known were but few, they seemed to present several distinct forms which are now found to pass so gradually into each other that we are compelled to unite the following species proposed by Brown (Prod. 262): *X. longifolia*, R. Br. from Port Jackson and Tasmania, *X. fluviatilis*, R. Br. from Grose River, and *X. arenaria*. Br. from Broad Sound and Thirsty Sound, all merge into the common paniculate forms of the species; *X. montana*, R. Br. from Grose river, which we have also from near Sydney. *J. D. Hooker*, and from Mount Tomah, *A.* and *R. Cunningham*, is a variety with the inflorescence almost reduced to a single spike of 1 to 2 in. with the subulate bracts mostly scarcely exceeding the perianths, a few of the lower ones only in some specimens considerably longer. *X. hystrix*, R. Br., from Hunter's, Paterson's, and Williams' Rivers, is a variety with much branched panicles, 2 to 5 outer bracts to each cluster, very divaricate, subulate, and ¼ to 1 in. long, whilst the flowers are small. We have it also from several collectors in the northern districts of N. S. Wales. Another paniculate variety, with the subulate bracts few and very small, was gathered by *F. Mueller* on Gillebrand's River and some other localities, but the specimens are old and the longer bracts probably worn away.

4. **X. rigida,** *R. Br. Prod.* 261.—Leafy stem shortly developed, rather thick, terminating a creeping rhizome. Leaves thick and rigid, under 1 ft. long, 2 to 2½ in. wide, spreading, obtuse truncate or unequally 2-toothed at the apex, the short broad imbricate sheaths covering the base of the stem, with broad scarious margins more or less red in the dried specimens. Male scapes from some of the lower axils flat and broad, 3 to 4 in. long including the inflorescence which occupies half the length and is shortly branched at the base. Flowers sessile in sessile clusters, the scarious hyaline bracts shorter than the perianth or the outer ones produced into a short point. Perianth-segments all equal and similar, narrow, about 1½ lines long. Stamens

attached to the base of the segments, those opposite the outer segments with much shorter filaments than the others. No rudimentary ovary. Female flowers and fruits unknown.—*Lomandra rigida*, Labill. Pl. Nov. Holl. i. 93, t. 120.

W. Australia, *Labillardière.* Lucky Bay, *R. Browne;* Cape Arid, *Maxwell.*

5. **X. Drummondii,** *F. Muell. Herb.*—Leafy base of the stem very short. Leaves 1 to 2 ft. long, rather rigid, flat, 2 to 3 or rarely 4 lines broad, mostly rounded at the apex, the imbricate sheathing bases rather long, with brown scarious margins not splitting into filaments. Male plant unknown. Female panicle sessile amongst the leaves, loosely branched, about 2 in. long, in fruit only in the specimens seen. Capsules subtended by perianth-segments rather more than 1 line long, apparently solitary within each bract, about 3 lines diameter, very smooth and shining, nearly globular when 2- or 3-seeded, very oblique or curved when 1-seeded.

W. Australia, *Drummond, n.* 59. This may possibly prove to be the real female of *X. Sonderi*, if the very different female specimens gathered by F. Mueller as such be properly referred to *X. odora* or *X. Endlicheri.*

6. **X. Sonderi,** *F. Muell. Fragm.* viii. 206.—Leafy base of the stem very short. Leaves 1 to 2 ft. long, rather rigid, flat, 1 to 2½ lines broad, mostly rounded at the apex, the imbricate sheathing bases rather long with brown scarious margins not splitting into filaments. Male scapes terminal, flat, rigid, 6 to 8 in. long below the inflorescence which is usually about 2 in. long, and shortly branched. Flowers sessile, in dense sessile clusters. Bracts broad, scarious, without points and shorter than the perianths. Perianth-segments all free from the base and similar, ovate, rather rigid, about 1 line long. Stamens attached to the base of the segments. Female flowers and fruits unknown for certain.—*X. rigida*, Endl. in Pl. Preiss. ii. 50.

W. Australia. King George's Sound and adjoining districts, *Preiss, n.* 1559, *Drummond, n.* 209 *and* 364, *F. Mueller.*

The female specimens gathered by F. Mueller and referred to this species (Fragm. viii. 206) are precisely similar to those of *X. Endlicheri*, and have not the foliage of the male *X. Sonderi*, which much more nearly resembles that of *X. Drummondii.*

7. **X. odora,** *Endl. in Pl. Preiss.* ii. 50.—Leafy base of the stem very short. Leaves 1 ft. long or more, very narrow almost filiform, slightly flattened, striate, with narrow scarious imbricate sheathing bases. Male scapes filiform, 2 to 4 in. long, including the simple inflorescence of about 1 in. Flowers sessile in sessile clusters along the rhachis. Bracts scarious, obtuse, shorter than the perianth. Perianth-segments all equal and free from the base, ovate, about ½ line long. Stamens attached to the base of the segments. Female flowers and fruit unknown.

W. Australia. Swan River, *Drummond*, 1st *coll.*; *Preiss, n.* 1529. This species appears to me to be nearly allied to *X. Sonderi*, rather than to *X. Endlicheri*, to which *F. Mueller* refers it, Fragm. viii. 205.

SERIES II. FASCICULATÆ.—Male flowers pedicellate and numerous in sessile clusters (irregular in *X. sororia*).

8. **X. multiflora**, *R. Br. Prod.* 262.—Leafy base of the stem very short and tufted. Leaves radical, rigid, 1 to 2 ft. long, varying from very narrow to nearly 2 lines broad. Scape terete or slightly flattened under the inflorescence, and including the inflorescence often longer than the leaves, but sometimes quite short, usually rigid. Panicle from a few inches to 1 ft. long, the branches rigid, divaricate, mostly in clusters of 3 to 6 from the same node, rarely again branched. Male flowers clustered along the branches or at the ramifications, all pedicellate. Bracts and bracteoles numerous, small, scarious, the bracteoles often connate. Pedicels filiform, sometimes scarcely exceeding the bracts, sometimes 2 to 3 lines long. Perianth-segments free nearly from the base, about 1 line long, the inner rather longer than the outer and sometimes slightly acuminate. Filaments rather long, 3 of them adnate to the inner segments nearly half way up, the other 3 free almost from the base. Female rhachis simple or with a few branches from the lower clusters. Flowers sessile, longer than in the males, the perianth-segments attaining sometimes 2 lines. Capsule about 3 lines diameter, the valves rigidly coriaceous, marked with more or less prominent transverse wrinkles.—*X. Brownei*, F. Muell. Fragm. viii. 206.

N. Australia. Islands off the north coast, *R. Brown*.

Queensland. Endeavour River and Bustard Bay, *Banks and Solander*; Keppel Bay, *R. Brown*; Moreton Bay, *Flood*; Peak Downs, *F. Mueller*; Rockhampton, *Thozet*, *O'Shanesy*, *Bowman*; Rockingham Bay, *Dallachy*; Port Denison, *Fitzalan*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and others; New England, *C. Stuart*; Hastings River, *Beckler*; Richmond River, *Fawcett*; Clarence River, *Wilcox*.

Victoria. Wendu Vale, *Robertson*; Glenelg River, *F. Mueller*; Portland, *Allitt*.

S. Australia. Encounter Bay, *Whittaker*.

The species varies much in the degree of ramification of the panicle, and the specimens described by R. Brown, Prod. 262, as *X. distans* and *X. æmula* from Sydney, *X. decomposita* from the north coast, and *X. media* and *X. multiflora* from Queensland, appear to me to be all only slight varieties of one species.

9. **X. sororia**, *F. Muell. in Herb. Kew.* Habit of the long rigid narrow-leaved forms of *X. filiformis*, but the panicles small, very narrow and compact, with very short erect branches or reduced to a single spike, and the flowers all erect and very shortly pedicellate. Fruit (in the Rockhampton specimens) rather longer than in *X. filiformis*, deeply marked with transverse wrinkles.

Queensland. Rockingham Bay, *Dallachy*; Bowen River, Rockhampton, *Bowman*.

Victoria. Mount M'Ivor, *C. Stuart*; Grampians, *F. Mueller*.

S. Australia. St. Vincent's Gulf, *F. Mueller*.

The specimens from all the localities are few or single only, and the species requires further illustration. It may prove to be a remarkably aberrant form of *X. multiflora.*

10. **X. Endlicheri,** *F. Muell. Fragm.* viii. 205.—Leafy base of the stem very short. Leaves narrow-linear or filiform, striate, flat or concave, from under 1 ft. to nearly 2 ft. long, the scarious imbricate sheathing bases rather long but very narrow. Scape slender, very variable in length, but always shorter than the leaves, the inflorescence simple or slightly branched. Male-flowers pedicellate in sessile clusters along the rhachis, the broad scarious bracts shorter than the filiform pedicels. Perianth-segments all free, ovate-oblong, thin and light-coloured with darker centres, varying from a little more than 1 line to nearly 2 lines in length, the inner ones rather larger than the outer. Filaments 3 attached to the base of the inner segments, 3 alternating with them. Ovary rudimentary. Female inflorescence simple, the flowers sessile and few in the clusters. Perianth nearly 2 lines long. Ovary very prominently 3-angled, tapering into a short style with recurved stigmatic lobes. Capsule ovoid, truncate, about 3 lines long, quite smooth.—*X. tenuifolia,* Endl. in Pl. Preiss. ii. 49, not of R. Br.

W. Australia. King George's Sound to Swan River, *Drummond, 1st coll. and n.* 816, *Harvey, Preiss, n.* 1530, *F. Mueller, Oldfield* and others; Port Gregory, *Oldfield.* The Swan River specimens have usually smaller flowers than those from King George's Sound, but do not otherwise differ.

11? **X. sericea,** *Endl. in Pl. Preiss.* ii. 51.—Closely allied to *X. Endlicheri,* of which F. Mueller (Fragm. viii. 206) thinks Oldfield's specimens may be a variety, with the lower part of the leaf sprinkled on the back and margins with long loose soft hairs not observed in any other species. Leafy base of the stem very short or slightly elongated. Leaves 1 to 2 feet long, flat or concave. Scape short, with a more branching and compact panicle than in *X. Endlicheri,* the pedicels very short. Flowers small but otherwise the same as in *X. Endlicheri.* Filaments very short, with ovate anthers. Females not seen.

W. Australia. Grantham, *Preiss, n.* 1542; Harvey River, *Oldfield;* Hampden, *Clark.* I have not seen Preiss's typical specimens, but the single ones from the two other stations agree with Endlicher's imperfect character. The species requires further investigation.

12. **X. purpurea,** *Endl. in Pl. Preiss.* ii. 49.—Leafy base of the stem very short and tufted, when old often surrounded by numerous split remains of old sheaths. Leaves very rigid, under 1 ft. long, 1 to 3 lines broad, thick, strongly striate, with prominent thick margins. Scapes longer than the leaves and sometimes attaining 2 feet, usually simple, with several globular sessile heads or umbels of numerous dark purple flowers, but sometimes reduced to a single terminal head, and occasionally 2 or 3 smaller pedunculate clusters proceeding from the lowest primary cluster. Bracts small, scarious, the outer ones ovate,

acuminate, the inner ones and bracteoles much shorter broad and obtuse. Perianth rotate, spreading to about 2 lines diameter, the segments all equal or the inner rather broader and almost petal-like. Anthers small, the bright yellow contrasting with the deep purple of the segments. Rudimentary ovary very small, conical, obtusely 3-angled. Female flowers unknown.

W. Australia. Swan River, *Drummond*, 1*st coll. Preiss*, *n*. 1534; Vasse River, *Oldfield*; Blackwood River, *Mrs. Hard*; Upper Hay River, *Miss Warburton*; Lake Muir, *Muir*.

Var. *capitata*. Inflorescence reduced to a single ovoid or globular terminal head, the pedicels short, but the flowers those of *X. purpurea*, not of *X. Preissii*.—Upper Hay and Kalgan Rivers, *F. Mueller*, *Miss Warburton*.

13. **X. Preissii,** *Endl. in Pl. Preiss.* ii. 50.—Very near *X. purpurea* and referred to it as a variety by *F. Mueller*. Leaves mostly longer and narrower, but the broadest of them have the thickened margins of that species. Scapes attaining 1 to 2 ft., but often not so long as the leaves, bearing a simple cylindrical spike of 1 to 1½ in., either quite close or slightly interrupted at the base. Male flowers much smaller than in *X. purpurea* and pale coloured, very shortly pedicellate in little dense globular clusters, all contiguous or the lower ones shortly distant. Perianth scarcely 1½ lines diameter when spread out, the structure otherwise as in *X. purpurea*. Female spike and habit the same as the male, but the flowers fewer sessile and rather larger. Ovary obtusely triquetrous, with a very short conical style and 3 large recurved stigmatic lobes. Stamens usually present, but with small imperfect anthers. Fruit of *X. Endlicheri*, but much smaller.

W. Australia. King George's Sound, *Maxwell*; Swan River, *Drummond*, 1*st coll. and n.* 807 *and* 808; *Priess*, *n*. 1532; Cape Naturaliste, *Oldfield*.

SERIES III. SPARSIFLORÆ.—Male flowers pedicellate or rarely sessile, singly scattered in simple racemes or loose panicles, rarely here and there two or three together.

14. **X. effusa,** *Lindl. in Mitch. Three Exped.* ii. 101.—Leafy base of the stem very short. Leaves densely tufted, long and rush-like rarely above 1 line broad and 2-pointed at the end, with rather long sheathing bases, the inner sheaths with scarious margins splitting into filaments. Flowers in slender spreading panicles of 2 to 4 in., nearly sessile within the tuft of leaves. Scarious bracts under the branches and pedicels very prominent, hyaline, ovate or lanceolate. Male flowers scattered along the branches, on filiform pedicels shorter than or more frequently longer than the perianth, solitary or rarely with a second more sessile flower within the same bract. Segments all free, lanceolate, of a slender almost petal-like consistence, nearly 2 lines long. Female flowers on shorter more rigid pedicels or quite sessile, rather

longer than the males. Capsule fully 4 lines diameter, the valves striate lengthwise.—*X. fragrans*, F. Muell.; Sond. in Linnæa, xxviii. 219.

N. S. Wales. In the interior? *Clowes;* towards the Murray River, *Mitchell.*
Victoria. Portland, *Allitt;* Murray River, *Beckler.*
S. Australia. From St. Vincent's Gulf to the Murray, *F. Mueller* and others; York Peninsula, *Miss Salmon.*
W. Australia. Swan River, *Drummond, 1st coll. and n.* 811; Port Gregory and Murchison River, *Oldfield;* Champion Bay, *Miss Guerin.*

15. **X. micrantha,** *Endl. in Pl. Preiss.* ii. 49.—Stems tufted, leafy at the base only. Leaves terete or slightly flattened and very narrow, usually striate, 6 in. to 1 ft. long, the scarious margins of the sheathing bases often split into filaments. Scape much shorter than the leaves, bearing in the males a panicle with filiform spreading branches and very minute bracts. Flowers scattered, solitary or 2 or 3 together under each bract, nearly sessile or the pedicel not exceeding the perianth. Perianth-segments all equal, very spreading, about 1 line long, dark coloured when dry. Female inflorescence much less branched and often quite simple, the flowers larger than in the males, often reflexed, the segments more rigid and less spreading. Capsule depressed-globular, nearly 3 lines diameter, quite smooth, the persistent perianth closely appressed to its base.

Victoria. Wimmera, *Dallachy;* Mount William, *Sullivan.*
S. Australia. Macclesfield, *F. Mueller;* Port Lincoln, *Wilhelmi.*
W. Australia. King George's Sound, *Muir;* Swan River, *Drummond, 1st coll. and n.* 809; *Preiss, n.* 1531.

Var. *sororia*, F. Muell. Leaves above 1 ft. long, flat, at least 2 lines broad. Panicle spreading, 6 to 10 in. long.—Mount Wellington, Gipps' Land, *F. Mueller.* Perhaps a distinct species.

16. **X. filiformis**, *R. Br. Prod.* 261.—Stems tufted, on a short hard rhizome, sometimes forming a very short branching caudex. Leaves radical, narrow-linear, sometimes almost terete and filiform, frequently canaliculate or flat and 1 to 2 lines broad or very rarely even broader; in luxuriant specimens 1½ to 2 ft. long, in dwarf specimens or varieties under 6 in., varying as in other species smooth or slightly scabrous. Scape very short under the inflorescence, terete or flat. Panicle narrow-pyramidal, sometimes almost reduced to a simple raceme of 2 or 3 in., almost sessile in the leaf-tufts, and varying from that to a length of 6 in. on a scape of 2 or 3 in., but always much shorter than the leaves, the branches short, the lowest often clustered. Flowers small, globular or ovoid, scattered along the branches on short recurved pedicels, each subtended by a narrow acute scarious bract shorter than the pedicel. Perianth-segments 1 to 1¼ lines long, generally larger in the females than in the males, the inner ones ovate or orbicular rather thick and petal-like, the outer thinner shorter and greenish. Filaments very short, 3 attached to the centre of the inner segments, 3 alternate with them at their base. No rudimentary ovary in the males nor staminodia in the females. Capsule ovoid-globular, about 3 lines diameter, often oblique by the abortion of 1 or 2 of the cells, the peri-

carp smooth, hard or almost fleshy, tardily opening.—*Dracæna filiformis*, Thunb. Diss. Drac. 4, fig. 1; *Xerotes Thunbergii*, F. Muell. Fragm. viii. 208.

Queensland. Moreton Bay, *F. Mueller* and others; Darling Downs, *Law;* Cooper's Creek, *Bowman;* Rockhampton, *O'Shanesy*; Rockingham Bay, *Dallachy.*
N. S. Wales. Port Jackson, *R. Brown, Sieber, n.* 496 and others; Hastings, Clarence, Macleay, and Richmond Rivers, *Beckler, Wilcox, Fawcett.*
Victoria. Wendu Vale, *Robertson*, common about Port Phillip and on the Yarra, *Gunn, F. Mueller* and others; Grampians, *F. Mueller;* East Gipps' Land, *Walter.*
S. Australia. St. Vincent's Gulf, *F. Mueller.*

I should include as scarcely distinct varieties of *X. filiformis*, four others proposed by Brown, Prod. 261, as species, all from Port Jackson: *X. laxa*, a rather broad long-leaved form, *X. gracilis* a long slender-leaved form, *X. tenuifolia* (marked by mistake in the Prodromus M.), finer leaved specimens than the typical *X. filiformis*, and *X. denticulata*, very slender, with short leaves.

17. **X. cæspitosa,** *Benth.*—Leafy base of the stem very short, but densely tufted on the rhizome. Leaves very narrow, subulate or filiform, 6 in. to nearly 1 ft. long, with scarious or brown sheathing bases. Scapes 2 to 3 in. long including the spike, which is usually simple and continuous or slightly interrupted. Male flowers sessile, scattered, solitary within the bracts, but sometimes 2 or 3 close together. Perianth-segments nearly 1½ lines long, the outer ones free very broad and hyaline; the inner rather longer and narrower more erect and somewhat petal-like. Stamens 3 attached to the inner segments, 3 at their base alternate with them; anther-cells distinct, attached to a small connective. Ovary a small rudiment. Female spikes (if properly matched) longer than the males, the flowers all reflexed on short pedicels. Perianth-segments about 2 lines long, all rigid, rather narrow, the inner rather longer than the outer.

W. Australia. King George's Sound and Swan River, *Oldfield, Drummond, 1st coll. and n.* 810 *and* 817; Albany, *F. Mueller.* There are two varieties, one with longer rather broader leaves, dense male spikes, pale coloured perianth-segments the inner ones broadly ovate, the other with filiform leaves, more slender and interrupted male spikes, dark coloured perianth-segments the inner ones almost orbicular.

18. **X. pauciflora,** *R. Br. Prod,* 261.—Leafy stems slender, branching at the base, sometimes forming dense tufts about 6 in. high, sometimes elongated to 1 or even 1½ ft. Leaves filiform, 1 to 6 in. long, their sheathing bases narrow and striate, not scarious. Racemes terminal, filiform, simple or scarcely branched, shorter than the leaves. Flowers few, nodding, solitary within subulate scattered bracts mostly shorter than the pedicel, or the lowest bracts rather longer and the uppermost minute or wanting, the pedicels varying from 1 to 2 lines. Male perianth nearly globular, scarcely above 1 line diameter, outer segments thin and ovate, inner nearly twice as long, orbicular, concave, thick with inflexed scarious margins. Anthers 3 almost sessile in the centre of the inner segments, 3 on short filaments alternating with them. Ovary a small rudiment. Female perianth narrow-turbinate, about 2½ lines long, the inner segments obovoid-oblong, thick and

concave but less so than in the males, the outer shorter as in the males, but not so thin. Capsules about 3 lines diameter, smooth and shining. —*X. graminea*, Endl. in Pl. Preiss. ii. 48; *X. asparagoides*, Endl. l. c. 49.

W. Australia. King George's Sound, *R. Brown*, *Fraser*, *A. Cunningham* and many others; thence to Swan River, *Preiss*, *n.* 1556, 1557, *Oldfield* and others.

The letters J. and M. attached in Brown's Prodromus severally to *X. pauciflora* and *X. tenuifolia* have by some clerical or typographical error been transposed, and thence the present plant has been named in the Banksian herbarium by Solander as *X. tenuifolia*. But Brown's herbarium as well as his diagnoses clearly show that he applied the name of *X. pauciflora* to the King George's Sound plant with elongated leafy stems, and that of *X. tenuifolia* to the Port Jackson stemless plant which I have considered as a variety of *X. filiformis*.

SECTION II. CEPHALOGYNE.—Male flowers sessile in sessile or rarely pedunculate clusters or heads, usually several on a common simple or branched rhachis; perianth divided to the middle only into 6 equal lobes. Female flowers sessile in solitary sessile or very shortly pedunculate heads; perianth divided to the base into 6 equal segments. Leafy stems often elongated, especially the females, the scapes peduncles or sessile heads terminal or in the upper axils.

19. **X. flexifolia,** *R. Br. Prod.* 260.—Stems slender, branching, leafy throughout, diffuse or ascending, rarely above 1 ft. long. Leaves linear, spreading, much twisted when dry, mostly 1 to 1½ in. long, their closely appressed sheaths covering the branches. Male flowers in dense globular clusters of about 3 lines diameter, sessile along the branches of a narrow panicle of 1 to 3 in., sessile or shortly pedunculate in the upper axils. Bracts small, scarious, obtuse. Perianth scarcely 1 line long, nearly globular, shortly divided into 6 nearly equal obtuse lobes. Stamens all inserted on the lobes below the middle. No rudimentary ovary. Female heads larger, solitary and closely sessile amongst the leaves. Perianth of 6 distinct lanceolate or ovate-acuminate segments, 1½ lines long or when in fruit 2 lines. No staminodia. Ovary very prominently 3-angled. Capsule not exceeding the perianth. —*Dracæna obliqua*, Thunb. Diss. Drac. 6, f. 2.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, *n.* 432 *or* 482 and many others.

20. **X. glauca,** *R. Br. Prod*, 260.—A low tufted species, the leafy base usually very short but sometimes especially in the females lengthening out to 5 or 6 in., and densely covered by the leaf-sheaths. Leaves narrow-linear, spreading, mostly 2 to 3 in. long but sometimes nearly twice that length, straight or slightly twisted, always much less than in *X. flexifolia* and their sheathing bases more or less split into filaments. Male inflorescence simple or shortly branched from the lower clusters, the flowers small, in globular clusters along the rhachis. Perianth under 1 line long, pale-coloured, globular-campanulate,

divided to near the middle into 6 equal lobes. Stamens all inserted on the lobes below the middle. No rudimentary ovary. Female heads much larger, closely sessile or very shortly pedunculate amongst the upper leaves. Perianth-segments ovate-lanceolate, 1½ to near 2 lines long. Capsule scarcely exceeding the perianth, slightly marked with transverse wrinkles.—Hook. f. Fl. Tasm. ii. 63; *X. mucronata*, Sieb. Pl. Exs. not of R. Br.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, *n.* 433 *or* 488 and many others. Twofold Bay, *F. Mueller*.

Victoria. Wendu Vale, *Robertson*; Wimmera, *Dallachy*.

Tasmania. Abundant in gravelly soil near Penguite, Norfolk Plains, etc., *Gunn* and others.

S. Australia. St. Vincent's Gulf, *F. Mueller*, *Behr.* and others; Venus Bay, *Warburton*; Rivoli Bay, *F. Mueller*.

Var. *occidentalis*. Leafy base of the stem not elongating but densely filamentose, with a male inflorescence more branched than in the common *X. glauca*; females not seen.

W. Australia. Cape Paisley and Esperance Bay, *Maxwell*. Possibly a distinct species.

21. **X. elongata,** *Benth.*—Leafy base of the stem very short. Leaves 1 to 1½ ft. long, very narrow, their sheathing bases rather long, with scarious margins splitting up into numerous filaments. Male inflorescence on a short scape simple or more frequently branched, 2 to 3 in. long, with small globular clusters of sessile flowers. Scarious bracteoles united round the flowers. Perianth above 1 line long when fully out, with a narrow turbinate dark-coloured entire base and 6 equal lobes shorter than the tube. Female flower-head solitary, globular, on a very short peduncle, the imbricate scarious bracts very prominent, with long points exceeding the flowers. Perianth stipitate within the bract, divided nearly to the base into petal-like segments above 1 line long.

Queensland. Moreton Island, *F. Mueller*.

N. S. Wales. New England, *C. Stuart*; Murray River and Mount Murchison, *Dallachy*.

S. Australia. Lake Bonney, *Herb. F. Mueller* (female specimens with leaves under 1 ft.).

22. **X. rupestris,** *Endl. in Pl. Preiss.* ii. 50.—Evidently nearly allied to *X. collina*, but the leafy stems do not appear to elongate below the sheathing bases of the actual leaves, though the rhizome or stock may be sometimes slightly elongated. Leaves very fine, linear-subulate, mostly above 1 ft. long, the broad sheathing bases not splitting into filaments. Male inflorescence like that of X. *collina*, but only seen in very young bud in Preiss's specimens; the females from Drummond's specimens have the ovoid-globular head and prominent scarious bracts of that species.

W. Australia. *Drummond, n.* 333 ♂ *and* 334 ♀ ; Cape Riche, *Preiss, n.* 1553.

23. **X. collina,** *R. Br. Prod.* 260.—Stems with a branching base lengthened to several inches, the lower part covered with the persistent bases of old sheaths, the upper part much thickened by the sheathing bases of perfect leaves. Leaves very narrow, straight or flexuose, flat or almost terete, the margins often scabrous, ½–1 ft. long, the broad imbricate sheathing bases split into numerous filaments. Male inflorescences on short scapes slightly branched, 2 to 3 in. long, with rather numerous sessile clusters of flowers. Bracts very scarious or hyaline, with a broad base and fine points or lanceolate from the base, scarcely exceeding the perianth ; the bracteoles short broad and obtuse. Perianth campanulate, about 1 line long, divided to the middle or rather lower down into 6 lobes all equal, or the inner ones rather narrower. Stamens inserted at the base of the segments. No rudiment of the ovary. Female flower-head ovoid-globular, solitary on a peduncle shorter than itself. Bracts scarious-hyaline, larger than in the males. Perianths shorter than in the males and more deeply divided but otherwise similar. No staminodia. Ovary very prominently triquetrous. Fruit not seen.

W. Australia. Lucky Bay, *R. Brown*, and probably in the same district, *Drummond, n.* 116 *and* 318.

24. **X. suaveolens,** *Endl. in Pl. Preiss.* ii. 50.—Stems tufted, the leafy base exceedingly short. Leaves radical, flat or almost terete, ½ to 1 ft. long and under 1 line broad, the old sheathing bases splitting into filaments. Male scapes including the inflorescence 1 to 3 in. long, with 1 terminal and 2 to 4 lateral sessile or pedunculate heads of many flowers. Bracts and bracteoles broad, scarious and imbricate, but much shorter than the flowers. Perianth almost sessile, usually about 2 lines long but variable in size, infundibuliform, with 6 petal-like lobes about as long as the narrow tube, all nearly equal or the inner ones rather smaller. Anthers narrow-oblong, shortly lobed at each end, on short filaments attached to the base of the lobes. No rudiment of the ovary.—X. *umbrosa,* Endl. l. c.

W. Australia. Swan river, *Drummond,* 1*st. coll. and n.* 813 ; *Preiss, n.* 1535, 1536 ; Cape Lewin, *Collie.*

The perianths in *X. umbrosa* are much smaller than in the typical *X. suaveolens,* but are in all other respects the same. Drummond's n. 814 is probably the female of the same species. The leaves are broader (about 1 line), the flower-heads solitary on scapes of about 1 in., the bracts broader and altogether larger than in the males ; the perianth very much longer, nearly 4 lines, with narrow lobes longer than the tube. Ovary very prominently 3-angled.

25? **X. turbinata,** *Endl. in Pl. Preiss.* ii. 51.—Stems densely tufted, the leafy base very short. Leaves terete, acute, mostly about 1 ft. long, but in some specimens shorter, the outer ones short with broad sheathing bases splitting into filaments, the inner with narrow sheathing margins. Scapes 1 to 2 in. long, bearing a single ovoid-turbinate head 5 or 6 lines diameter. Bracts lanceolate-linear, very acute and rigid. Perfect flowers unknown, but in all the rather numerous specimens both of Preiss and Drummond there is within each bract what appears to be a perianth split nearly to the base into a dense tuft of long hairs enclosing an apparently imperfect narrow ovary, tapering into a short style, with minute spreading stigmatic lobes. Capsules (which I have not seen) transversely wrinkled according to Endlicher.

W. Australia. Swan river, *Preiss, n.* 1540 ; *Drummond, n.* 330.

Drummond's n. 124 may possibly be the male of this species, but the flowers are all fallen away from the specimens, leaving a short rhachis which had probably borne several heads.

SECTION III. SCHŒNOXEROS.—Barren stems rush-like, leafless except sheathing scales at the base. Flowering scapes very short and leafless, with 2 or 3 flower-heads, the males and females nearly similar.

26. **X. spartea,** *Endl. in Pl. Preiss.* ii. 51.—Stems numerous, tufted on a creeping rhizome, leafless except sheathing scales covering the base and often split into filaments, the inner ones sometimes bearing a short erect lamina, the stems mostly barren (described as leaves but enclosed in several sheaths and not dilated into a sheath at the base), terete, slender but rigid, 1 to 2 feet long. Flowering scapes attached to the rhizome, 1 to 3 in. long, leafless like the barren stems, bearing a terminal globular flower-head 1½ to 2 lines diameter and 1 to 4 globular clusters enclosing the scape lower down. Bracts and bracteoles scarious, shorter than the perianth. Perianth on a pedicel much shorter than the bract, campanulate, under 1 line long, divided to below the middle into 6 broad nearly equal segments, the outer ones much more coloured than the inner. Stamens attached to the base of the segments. No rudiment of the ovary. Females unknown.

W. Australia. Darling Range, rare, *Preiss, n.* 1533.

27. **X. juncea,** *F. Muell. in Hook. Kew Journ.* viii. 333.—Stems numerous, tufted on a creeping rhizome, leafless except sheathing scales covering the base for about 1 in., of which 1 or 2 sometimes bear a short lamina ; barren stems as in *X. spartea,* described as leaves, terete, rigid, rush-like, ending in a pungent point, mostly under 1 ft. high. Flowering scapes very much shorter, attached to the rhizome, with a terminal globular head 3 or 4 lines diameter, and 2 or 3 others lower down sessile and enclosing the scape. Bracteoles nearly as long as the perianth, split into a hairy fringe as in *X. leucocephala,* but not nearly so deeply. Flowers only known from the remnants of some

old ones, apparently like those of *X. leucocephala.* Capsule obovoid-globular, shortly acuminate, 3-furrowed, smooth, about 3 lines diameter.

S. Australia. Port Lincoln, *Wilhelmi.*

SECTION IV. TYPHOPSIS.—Flower-heads or spikes globular or cylindrical, very dense, the bracts split into dense masses of woolly hairs; males and females similar.

28. **X. leucocephala,** *R. Br. Prod.* 260.—Stems tufted with very short leafy bases. Leaves radical or nearly so, 1 to 2 ft. long and scarcely above 1 line broad, with scarious margins at the base split into long fine filaments, and bordered here and there by a few filaments higher up. Scapes much shorter, rarely attaining 1 ft., slender and terete or slightly flattened in the lower portion. Flower-heads usually globular or ovoid, very dense, about ½ in. diameter, either solitary and terminal or with 2 or 3 additional ones enclosing the scape at a distance from each other, or rarely 2 or 3 united in a cylindrical terminal spike. Bracts subtending the flowers shorter than the perianth, or rarely with subulate points protruding from the head before the flowers expand. Scarious bracteoles split low down or quite to the base into very numerous crisped filaments or hairs as long as the perianth, giving the head a woolly appearance and often described as wool on the receptacle. Perianth infundibuliform, 2½ to nearly 3 lines long, with 6 ovate lobes, 3 outer hyaline attached about halfway up the tube, 3 inner ones longer more petal-like and white about half as long as the tube. Stamens in the males attached immediately below the inner lobes. Ovary rudimentary at the bottom of the tube. Female flower-heads sometimes closely resembling the males, but more frequently forming a continuous spike. Outer perianth-segments rather larger in proportion to the inner. Ovary obovoid, almost stipitate. Fruit obovoid, acuminate, hard and shining.—*X. filamentosa,* A. Cunn. MS.; Brongn. in Duperr. Voy. Bot. 183, t. 35; *X. typhina,* Lindl. in Mitch. Three Exped. ii. 41.

Queensland. Keppel Bay, *R. Brown;* Port Curtis, *M'Gillivray;* Darling Downs, *Law;* Curriwillighie, *Dalton;* Boyne, *Hartmann.*

N. S. Wales. In the N. W. interior, *Fraser, A. Cunningham;* New England, *Leichhardt;* Balonne River, *C. Moore;* Mudgee, *Woolls;* Murray River, *Mitchell;* Lachlan and Darling Rivers and thence to the Barrier Range, *Victorian and other Expeditions.*

Victoria. N. W. districts, *L. Morton* and others.

S. Australia. Encounter Bay, *Whittaker;* St. Vincent's Gulf, *F. Mueller* and others; Lake Gairdner, *Babbage;* north of Fowler's Bay, *Giles.*

SECTION V. MACROSTACHYA.—Flower-clusters closely arranged in a long terminal cylindrical spike with scarious not filamentose bracts and bracteoles, the males and females similar.

29. **X. hastilis,** *R. Br. Prod.* 263.—Stems tufted, the leafy base very short. Leaves radical or nearly so, 2 to 3 feet long, 2 to 3 lines broad, the brown scarious margins of the sheathing bases at length splitting into filaments. Scape terete or nearly so, several feet high, bearing a dense continuous cylindrical spike 6 in. to 1 ft. long and 5 to 6 lines diameter, nearly similar in the males and females. Bracts short broad and scarious, bracteoles similar, nearly as long as the perianths, more or less united in a cup round each flower and persistent after the flowers have fallen away. Perianth campanulate, nearly 2 lines long, divided in the males almost to the base into 6 nearly equal deeply coloured segments, more united at the base in the females. Stamens attached to the base of the segments, usually rudimentary in the females. Ovary rudimentary but present in the males, attached by a broad base to the thick base of the perianth; in the females also broadly attached, acuminate. Capsule broadly obovate, acuminate, hard, 3-furrowed, rather longer than the perianth.—Endl. in. Pl. Preiss. ii. 51.

W. Australia. King George's Sound, *R. Brown*; in various places to the eastward, but rare, *Maxwell*, *Drummond*, *n.* 331, *Preiss*, *n.* 1551.

Before the flowers expand they appear to be in short sessile distinct spikelets with the subtending bracts distichously imbricate, but at the time of flowering they are all consolidated into the long spike above described, with something of the aspect of a *Xanthorrhœa*.

2. CHAMÆXEROS, Benth.

Flowers hermaphrodite or perhaps polygamous. Perianth of 6 segments all nearly equal, the 3 outer rather more rigid and broader than the 3 inner. Stamens 6, 3 attached to the base of the inner segments, 3 alternate with them, all shorter than the perianth; anthers versatile, shortly lobed at both ends, the cells opening inwards in longitudinal slits. Ovary 3-celled, with 1 ovule laterally attached in each cell; style filiform, with a small terminal stigma. Fruit unknown, probably the same as in *Xerotes.*—Tufted perennials, with the habit of some species of *Xerotes*. Leaves radical, rigid, the young ones bordered by a scarious lacerated margin. Scapes short. Flowers pedicellate, in sessile clusters, with short imbricate scarious bracts.

The genus is limited to West Australia, and has been included in *Xerotes*, from which it differs in the flowers mostly hermaphrodite and the filiform undivided style, neither of which characters, any more than the lacerated margins of the leaves, occur in any of the numerous species known of *Xerotes*.

Leaves flat. Scapes with a single terminal globular flower-head or umbel	1. *C. Serra.*
Leaves terete. Scapes with a branching panicle of small flower-clusters	2. *C. fimbriata.*

1. **C. Serra,** *Benth.*—Stems densely tufted, the very short base covered with imbricated sheathing scales. Leaves in radical tufts,

erect, rigid, flat, scarcely above 6 in. long, 1 to 1½ lines broad, bordered the greater part of their length by a narrow scarious margin broken up into reflexed serratures and sometimes wearing off from the older leaves. Scapes rigid, proceeding from the imbricate scaly base of the stock by the side of the leaf-tufts, about 1 in high, bearing a single umbel or cluster of numerous flowers, the very numerous scarious imbricate bracts and very broad bracteoles forming an obovoid or globular head 3 to 4 lines diameter. Pedicels filiform, 2 or 3 times as long as the bracts. Perianth-segments narrow, about 2 lines long. Stamens nearly as long, with ovate anthers. Ovules apparently perfect in all the flowers examined.—*Xerotes serra*, Endl. in Pl. Preiss. ii. 49.

W. Australia. Swan River, *Drummond, 1st coll. and n.* 819; *Preiss, n.* 1539; Stirling Range, *F. Mueller.*

2. **C. fimbriata,** *Benth.*—Leaves distichously sheathing on the very short base of the stem, erect, often curved, rigid, terete or slightly flattened, 1 to 1½ in. long, the younger ones bordered by a narrow scarious lacerated margin which disappears from the older ones. Scapes from within the tufts very short, bearing a loose branching pyramidal panicle of 2 to 4 in., the branches divaricate and almost filiform. Flowers pedicellate in small clusters of short scarious bracts, terminal or sessile along the branches, the filiform pedicels usually at least as long as the perianth. Perianth-segments oblong, a little more than 1 line long. Anthers small, on filiform filaments. Ovules apparently perfect in the flowers examined —*Xerotes fimbriata*, F. Muell. Fragm. viii. 211.

W. Australia, *Drummond, n.* 329.

3. ACANTHOCARPUS, Lehm.

Flowers hermaphrodite. Perianth of 6 segments, all equal, thin almost hyaline with a more opaque centre. Stamens 6, 3 attached to the base of the inner segments, 3 alternate with them; anthers versatile, lobed at the base, the cells opening inwardly in longitudinal slits. Ovary sessile, tapering into a short style with a small stigma, 3-celled, with 1 ovule laterally attached in each cell. Capsule globular, 3-valved, muricate. Seeds nearly globular, laterally attached; testa thin and appressed; albumen hard, embryo linear, slightly curved, oblique in the lower part of the seed.—Stems slender, leafy. Flowers small, nearly sessile in terminal clusters.

The genus is limited to the single Australian species, differing from *Xerotes* like *Chamaexeros* chiefly in the hermaphrodite flowers and undivided style.

1. **A. Preissii,** *Lehm. in Pl. Preiss.* ii. 274.—Habit nearly of *Xerotes flexifolia.* Stems rigid but rather slender, with numerous short divaricate branches, forming either dense tufts of 6 in. to 1 ft. or a straggling shrub of 1 to 2 ft. Leaves numerous, with long striate sheaths covering the branches, the blade spreading, linear, rigid, from subulate to almost lanceolate, ½ to nearly 2 in. long, straight or slightly

twisted. Flower-heads or clusters small sessile and terminal or becoming lateral by the elongation of the branch. Bracts scarious, broad, shorter than the perianth. Flowers sessile or nearly so. Perianth-segments oblong, from 1¼ to nearly 2 lines long, the outer ones rather more rigid than the inner. Anthers ovate. Capsule 3 or 4 lines diameter, straw-coloured, the valves densely muricate with short points or tubercles.—*Xerotes echinata*, A. Cunn. Herb.

W. Australia. Swan River, *Drummond*, 1*st coll. and n.* 304, 820, *Preiss*, *n.* 428, 3298; Murchison River, *Oldfield*: Rottenest and Dirk Hartog's Islands. *A. Cunningham.*

The species varies much in the length and breadth of the leaves, in the size of the flowers in rather dense clusters or almost solitary, closely sessile or shortly pedicellate, and somewhat in the texture of the perianth, but I have never seen even in Preiss's own specimens the outer-segments herbaceous nor really acute nor 2 seeds in each cell of the capsule as described by Lehmann.

Xerotes mucronata, R. Br. Prod. 260, from Lucky Bay, of which the specimens in Herb. Br. are in leaf only, with slight remains of flowers, may possibly be the *Acanthocarpus Preisii*.

TRIBE II. XANTHORRHÆÆ.—Outer perianth glume-like, inner thin and scarious or petal-like, the flowers usually small. Anthers entire at both ends, versatile, dorsally attached about the middle. Style subulate, with a small terminal stigma. Caudex either very short thick and hard, or elongated and woody.

4. XANTHORRHÆA, Sm.

Perianth persistent, of 6 distinct segments, the 3 outer glume-like, erect, concave or almost hoodshaped at the top, 3- or 5-nerved, almost scarious on the margins, the 3 inner much thinner, usually 5-nerved, erect within the outer ones but more or less protruded beyond them into a short hyaline or white and petal-like spreading lamina. Stamens 6, hypogynous or those opposite the inner segments slightly adherent to their base, longer than the perianth and all equal; filaments somewhat flattened or thickened at the base, usually spreading horizontally beyond the perianth, contracted at the end into an inflexed point; anthers oblong or rarely ovate, entire at both ends, dorsally attached in the middle, the cells opening longitudinally. Ovary sessile, 3-celled, with few ovules in each cell near the base, tapering upwards into an undivided subulate style, with a terminal entire or 3-grooved stigma. Capsule protruding from the persistent perianth, ovoid or acuminate, hard brown and shining, 3-valved. Seeds 1 or 2 in each cell, erect, ovate or oblong, flat, bordered by narrow margins; testa black, almost crustaceous but not shining; albumen fleshy but very firm almost cartilaginous; embryo linear, transverse in the middle of the seed, straight or curved.—Long-lived perennials, with a thick woody caudex, from very short to arborescent. Leaves in a dense tuft at the top of the caudex, long-linear, brittle, spreading or recurved, their broader closely imbricate bases remaining long persistent. Scape or peduncle terminal, hard, often several feet long, terminating in a dense cylin-

drical spike of numerous sessile flowers, closely packed with numerous bracteoles surrounding each flower within a small or subulate subtending bract. Caudex in several species emitting a copious dark or yellow resinous gum.

The genus is limited to Australia, where under the name of 'grass-trees' or 'black-boys' some of the species form a conspicuous feature in the landscape.

Inner perianth-segments with obovate or orbicular white laminæ conspicuously spreading above the outer ones. Spikes short (rarely 8 in.). Caudex very short.

Bracts and outer perianth-segments glabrous. Eastern species.

Spike above 1 in. diameter. Inner perianth-segments 5 lines long. Stamens twice as long . . . . . 1. *X. macronema.*

Spike 7 or 8 lines diameter. Inner perianth-segments about 3 lines long . . . . 2. *X. minor.*

Bracts and outer perianth-segments tipped with a dark pubescence. Western species . . . . 3. *X. gracilis.*

Inner perianth-segments with shortly dilated hyaline or whitish ends, but little longer than the outer and scarcely spreading.

Leaves much flattened, narrow. Scape under 1 ft., spike about 1 in. long . . . . 4. *X. pumilio.*

Leaves much flattened and mostly 2 to 3 lines broad (except towards the point). Spike 2 to 6 ft. long.

Spike densely tomentose-pubescent. Caudex very short . . . . 5. *X. hastilis.*

Spike glabrous or nearly so.

Bracteoles obtusely spathulate or scarcely acuminate. Caudex arborescent. Eastern species 6. *X. arborea.*

Bracteoles much acuminate. Caudex very short. Southern species . . . . 7. *X. semiplana.*

Leaves 1 to nearly 2 lines broad, the dorsal angle usually and the facial one sometimes acutely prominent.

Subtending bracts with subulate points very prominent on the young spike.

Caudex very short. Spike usually under 1 ft. long 8. *X. bracteata.*

Caudex shortly arborescent. Spike usually 2 ft. or more . . . . 9. *X. australis.*

Subtending bracts concealed under the bracteoles and perianth. Caudex usually arborescent. Spike 2 to 6 ft.

Scape usually longer than the spike. Southern species . . . . 10. *X. quadrangulata.*

Scape usually not so long as the spike. Western species . . . . 11. *X. Preissii.*

1. **X. macronema,** *F. Muell. Fragm.* iv. 112.—Caudex not seen. Leaves narrow nearly flat or acutely triquetrous, 2 to 3 ft. long. Scapes above 1 ft. long. Spike 4 to 8 in. long, thick and very dense, the flowers much flattened and larger with longer stamens than in any other species. Bracts linear-spathulate, quite glabrous, nearly as long as the outer perianth-segments. Outer segments oblong, shortly acuminate, about 3 lines long, concave, quite glabrous, inner segments fully 5 lines

long, with white obovate spreading laminæ. Stamens nearly twice as long as the perianth; anthers ovate-oblong.

Queensland. Moreton Island, *M'Gillivray.*
N. S. Wales. Hastings River, *Beckler;* Brunswick and Tweed Rivers, *C. Moore.*

2. **X. minor,** *R. Br. Prod.* 288.—Leaves crowded on the very short and thick caudex, 1 to 2 ft. long and from 1 to nearly 2 lines wide, flat but thick or more or less triquetrous. Scape when full grown often longer than the leaves, the spike 3 to 6 in. rarely 7 or even 8 in. long, 7 to 8 lines diameter when fully out. Spathulate bracts and outer perianth-segments shortly acuminate, about 2 lines long, quite glabrous or minutely ciliate at the end; inner segments with white obovate spreading laminæ scarcely 1 line broad. Stamens about twice as long as the perianth, very spreading; anthers ovate-oblong, much smaller than in most species. Capsule acuminate and 7 to 8 lines long in some of the northern specimens, shorter and more obtuse in the southern ones.—Hook. f. Fl. Tasm. ii. 59; F. Muell. Fragm. iv. 112; Bot. Mag. t. 6297.

N. S. Wales. Port Jackson, *R. Brown, Backhouse;* Richmond River, *Mrs. Hodgkinson.*
Victoria. Wendu Vale, *Robertson;* Port Phillip, Melbourne, Dandenong Range, *F. Mueller* and others; French Island, *Beveridge;* Gipps' Land, *F. Mueller.*
Tasmania. Abundant, covering in some places large tracts of ground, *J. D. Hooker.*

3. **X. gracilis,** *Endl. in Pl. Preiss.* ii. 39.—Leaves crowded on the very short caudex, mostly about 2 ft. long and 2 to 2½ lines broad, flat or triquetrous, with broad dark bases. Scapes 2 to 3 ft. high, the spike from 2 to 5 in. long and 7 or 8 lines diameter when fully out, resembling that of *X. minor* except in the dark colour given to it by the rusty brown pubescence on the tips of the bracts and outer perianth-segments. Bracts oblong-linear or slightly spathulate, 2 to 2½ lines long. Outer perianth-segments as long as the bracts, obovate-oblong, with concave tips pubescent outside; inner segments with broad white spreading laminæ, about 1 line diameter, contrasting with the dark colour of the rest of the spike. Filaments longer than the perianth, at first erect, at length spreading; anthers shortly ovate.—F. Muell. Fragm. iv. 112.

W. Australia. Swan River, *Preiss, n.* 1619; Blackwood River and Cape Naturaliste, *Oldfield;* Perongerup, *F. Mueller,* the latter specimens remarkable for the spiral twist of the bunch of leaves.

4. **X. pumilio,** *R. Br. Prod.* 288.—Caudex not elongated. Leaves under 1 ft. long, very much recurved, flat, the dorsal midrib but slightly prominent, 1 to 2 lines broad. Scape under 1 ft. high, with a spike only about 1 in. long, oblong-cylindrical when in flower, ovoid-globular when in fruit, apparently glabrous, with the obtuse bracteoles and perianth of *X. arborea,* the flowers smaller than in any other species.

Queensland. Port Curtis, *R. Brown*, a diminutive species to which I have not seen any approach in any other collection.

5. **X. hastilis,** *R. Br. Prod.* 288.—Caudex very short or often scarcely prominent. Leaves 3 to 4 ft. long, 2 to 3 lines broad, flat in front but with the dorsal angle more or less prominent. Scape often 6 to 8 ft. long below the spike, which attains from 1½ to 2 ft. but is not so thick as that of *X. arborea*, and readily known by the dense rusty tomentum covering the ends of the bracts and outer perianth-segments, especially conspicuous before the flowers expand. Bracts linear-spathulate, mostly very narrow. Outer perianth-segments about two lines long, oblong, 3- or 5-nerved, opaque, concave, scarcely acuminate, pubescent outside; inner ones very little longer, dilated hyaline and somewhat spreading at the end. Filaments only shortly exceeding the perianth. Full-grown fruiting spikes under 1 in. diameter without the capsules, which are about ½ in. long, obtuse, protruding from the spike.—F. Muell. Fragm. iv. 113; Bot. Mag. t. 4722.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and several others.

The Flinders Island specimens "bracteis perianthiisque imberbibus" referred by Gunn in Hook. f. Fl. Tasm. ii. 59 to *X. hastilis*, must belong to some other species, but having no specimens it is impossible to identify it.

6. **X. arborea,** *R. Br. Prod.* 288.—Caudex growing out to several feet in height with a diameter of 6 to 9 in. Leaves as in *X. hastilis* flat or triquetrous, 3 to 4 ft. long and 2 to 3 lines broad. Scape under the spike attaining 5 or 6 ft. and the spike itself 3 to 4 ft. long, 1 to 1½ in. diameter when full grown without the capsules. Bracts linear-spathulate, nearly as long as the perianth, quite glabrous or slightly ciliate at the tips. Perianth-segments about 3 lines long, 3-nerved, the outer ones concave at the end with a very short obtuse point, either quite glabrous or shortly and sparingly pubescent; inner ones scarcely longer, the dilated ends hyaline and slightly spreading. Stamens not much longer than the perianth. Capsule 7 to 8 lines long, more acuminate than in *X. hastilis*.

Queensland. Rockhampton, *O'Shanesy*, *Bowman* and others, with narrow leaves and the spike not so thick as in the Port Jackson specimens, but apparently the same species.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls* and others.

7. **X. semiplana,** *F. Muell. Fragm.* iv. 111.—Caudex not elongated. Leaves long, about 8 lines broad and flat with the dorsal angle obtuse and but slightly raised in the lower part, tapering however into a narrow triquetrous point. Scape stout, about 2 ft. long, the spike about the same length, from ¾ to 1 in. diameter when in flower. Bracts linear, much acuminate. Perianth about 3 lines long, the outer segments obovate, concave at the end, scarcely or not at all acuminate, quite glabrous, the inner ones scarcely longer.

S. Australia. Lofty Range and Gawler River, *F. Mueller.* The leaves spike and flowers nearly those of *X. arborea*, but besides the caudex being undeveloped, the bracts or bracteoles surrounding the perianths are remarkably narrow and acuminate.

W. Australia ? Some specimens gathered by *F. Mueller* north of Stirling Range look more like this species than any other W. Australian one, but are insufficient for satisfactory identification.

8. **X. bracteata,** *R. Br. Prod.* 288.—This has the narrow leaves and often the short spike ot *X. minor*, but with the bracts or bracteoles and flowers nearer those of *X. semiplana.* Caudex very short. Leaves about 2 ft. long, 1 to 1½ lines broad, concave on the upper side, the dorsal angle slightly projecting in the lower part, tapering upwards into a narrow triquetrous point. Scape 2 to 3 ft. high, the spike usually 4 to 6 in. long and little more than ½ in. diameter, but in some larger specimens twice that length and ¾ in. diameter. Subtending bracts subulate and very conspicuous in the young spike, but most of them fallen away at the time of flowering or concealed by the outgrowing perianths. Bracts or bracteoles surrounding the flowers linear or linear-spathulate, distinctly acuminate, glabrous or with a tuft of a few hairs on their apex, all shorter than the perianth. Outer perianth-segments oblong, almost hoodshaped and acuminate at the top, scarcely 2½ lines long; inner segments rather longer, their dilated hyaline ends slightly spreading but much less conspicuous than in *X. minor.* Fruit small.

N. S. Wales. Port Jackson, *R. Brown;* Paramatta, *Woolls.*

Queensland ? Some fruiting specimens in Herb. F. Mueller from between the Gillibrand and Barwan Rivers appear to belong to this species, others from Springsure have the subtending bracts prominent in the young spike, but not so long as in the typical *X. bracteata* and more lanceolate and the fruiting scape is said to be 1 in. diameter, the other characters being those of *X. bracteata.* Other more doubtful specimens from Newcastle Range, *F. Mueller*, and Whitsunday Island, *Henne*, have a similar foliage, but of the former leaves only have been preserved, of the latter there is a single very young spike in which the subtending bracts are short and triangular, though numerous and imbricate.

9. **X. australis,** *R. Br. Prod.* 288.—Caudex elongated but rarely exceeding 2 ft. Leaves about 2 ft. long, 1 to 1½ lines broad, rather flat, but with the dorsal angle and sometimes also the facial one prominent. Scape usually about 2 ft. high and the spike when full grown rather longer and nearly 1½ in. diameter. Subtending bracts subulate, very prominent in the young spike as in *X. bracteata*, but disappearing from the fully flowered spike. Bracteoles and outer perianth-segments glabrous, remarkably acuminate; inner segments not seen perfect, but from the withered remains probably not much exceeding the outer ones. Fruit obtuse, less protruded than in any other species.—Hook. f. Fl. Tasm. ii. 58, F. Muell. Fragm. iv. t. 110.

Victoria. Grass-tree plains of Curdie's River, granite rocks on Snowy River, and dry ridges on Hume River, *F. Mueller.*

Tasmania. Risdon Cove, *R. Brown;* north coast, *Gunn.*

10. **X. quadrangulata,** *F. Muell. Fragm.* iv. 111.—Caudex lengthening out to several feet. Leaves slender but rigid, 1½ ft. long, strictly 4-angular though sometimes slightly flattened, rarely above 1 line broad. Spike 3 or 4 ft. long on a scape at least as long or longer, 1½ in. thick when in flower. Bracts or bracteoles surrounding the flowers nearly as long as the outer perianth-segments, glabrous. Outer segments oblong-spathulate, concave or almost complicate, very shortly acuminate, quite glabrous; inner segments obtuse, about 3 lines long, 3- or 5-nerved, the whitish shortly flattened apex very little exceeding the outer segments. Stamens not much longer than the perianth. Fruit not seen.—Bot. Mag. t. 6075.

S. Australia. Mount Lofty and Barossa Ranges, *F. Mueller.*

11. **X. Preissii,** *Endl. in Pl. Preiss.* ii. 39.—Caudex thick and simple either very short or more or less elongated, attaining often 5 or 6 ft. and sometimes according to Oldfield as much as 15 ft. Leaves from a short broad flat base 2 to 4 ft. long, from scarcely above 1 line to nearly 2 lines broad, rigid, very brittle when young, mostly nearly flat on the inner face with the dorsal angle prominent so as to be acutely 3-angular, but sometimes the midrib raised on the inner face also so as to make them quadrangular as in *X. quadrangularis.* Scapes 2 to 6 ft. long including the spike which occupies from one half to nearly the whole length and when fully out is about 1 in. diameter. Subtending and outer-empty bracts ovate-oblong or lanceolate and prominent only on the very young spike; bracts or bracteoles surrounding the flowers linear-spathulate, nearly as long as the perianth, and often slightly ciliate at the end. Perianth-segments 3 to 3½ lines long, the outer ones thin, rigid, oblong, concave, 3- or rarely 5-nerved, the inner ones broader, with 5, 7 or even more nerves, with a very short spreading almost hyaline apex. Stamens twice as long as the perianth. Capsule 5 to 6 lines long.—*X. Brunonis,* Endl. in Pl. Preiss. ii. 39; *X. Drummondii,* Harv. in. Hook. Kew Journ. vii. 57; *X. pecoris,* F. Muell. Fragm. iv. 110.

W. Australia. Apparently common, from Stirling Range to the Vasse and Swan Rivers, *Drummond, Oldfield, Preiss, n.* 1620, 1621, *F. Mueller* and others.

I may be wrong in uniting the above supposed species but I am quite unable to distinguish them by the dried specimens. The leaves are often as quadrangular in the typical *X. Preissii* as in *Drummondii*, and the difference between the elongated and the short stem is accompanied by no other character that I can detect, and may possibly depend upon age.

5. DASYPOGON, R. Br.

Perianth persistent, 6-merous, dry or glumaceous, the 3 outer segments united in a tube, with 3 ovate lobes, the 3 inner free narrow, and not exceeding the outer. Stamens 6, hypogynous or scarcely adhering to the base of the perianth and longer than the segments; filaments rather thick; anthers oblong, entire at both ends, dorsally attached in the middle, the cells opening longitudinally. Ovary sessile

3-angled, 1-celled or imperfectly divided into 3 cells, with 3 ovules erect from near the centre of the cell, two of them often minute and abortive from the time of flowering; style subulate, with a small terminal stigma. Fruit 1-seeded globular and indehiscent, entirely enclosed in and almost adnate to the thickened and hardened tube of the outer perianth. Seed globular, erect; testa membranous; embryo linear, erect or nearly so, near the base of the fleshy but not hard albumen.—Long-lived perennials with a simple or slightly branched caudex, covered when old with the persistent sheath of old leaves. Leaves crowded at the apex of the caudex or base of the flowering stems, rarely extending higher up the stems, narrow-linear spreading and rigid. Flowers in globular heads on long terminal peduncles, each one sessile within a persistent bract without bracteoles.

The genus is limited to West Australia.

Caudex short and slender. Leafy stems including the peduncle 1 to 2 ft. Perianth with long slender very deciduous bristles . . . . 1. *D. bromeliæfolius.*

Caudex with the persistent sheaths 2 in. diameter and 2 to 6 ft. long. Perianth-tube hispid with short persistent bristles . . . . 2. *D. Hookeri.*

1. **D. bromeliæfolius,** *R. Br. Prod.* 263, *and in Flind. Voy.* ii. 608, *t.* 8.—Stems from a hard rhizome several, erect or ascending, densely leafy at the base or for a length of from 6 in. to 1 ft. or more rarely when old leaving a slender caudex at the base not above $\frac{1}{2}$ in. thick including the persistent leaf-sheaths. Leaves spreading, 6 in. to above 1 ft. long, 2 lines broad or more below the middle, tapering upwards to a fine point, rigid with the margins scabrous-denticulate, often twisted so as to be very oblique, expanded at the base into broad striate long-persistent sheaths; in some old specimens with the stems leafy for a considerable length the leaves are only 2 to 3 in. long. Peduncle terminal, 6 in. to 1 ft. long, very hispid with spreading or slightly reflexed bristles or rigid hairs, leafless or with a few distant small leaves. Flower-head dense, about 1 in. diameter, very hispid with the long bristles of the perianth, which however are usually very deciduous, leaving the fruiting head almost or quite glabrous. Bracts closely appressed, with broad bases shorter than the perianth, but the outer ones and sometimes some of the inner ones produced into long subulate points far exceeding the flowers. Perianths 3 to $3\frac{1}{2}$ lines long, the outer segments united to nearly $\frac{3}{4}$ of their length; not much lengthened when in fruit, but thickened hardened smooth and shining; inner segments linear or linear-spathulate; slightly scarious on the edges.—F. Muell. Fragm. ii. 112; *D. glaber*, Laharpe in Mem. Soc. Hist. Nat. Par. iii. 101.

W. Australia. King George's Sound, *R. Brown*, *Drummond*, *n.* 205, eastward to Phillips River and Mount Barren, *Maxwell*; Swan River, *Preiss*, *n.* 1871, 1872.

D. obliquifolius, Lehm. in Pl. Preiss. ii. 52, is founded on old specimens of *D. bromeliæfolius*, with shorter leaves extending higher up the stem than in the ordinary state.

2. **D. Hookeri,** *Drumm. MS.; F. Muell. Fragm.* ii. 112.—Stem or caudex simple, erect, attaining many feet in old specimens, about 1 in. diameter, encased in the persistent sheaths of old leaves which thicken it to 2 in. diameter. Leaves very numerous at the end of the caudex, mostly above 1 ft. long, with broad imbricate sheathing bases. Scapes or peduncles as long as or longer than the leaves, densely scabrous with closely-reflexed short almost scale-like hairs. Flower-head globular and bracts similar to those of *D. bromeliæfolius*, but the tube of the outer perianth densely covered with short rigid erect or spreading almost paleaceous bristles, the lobes ovate and quite glabrous, without any of the long deciduous bristles of that species. Inner perianth stamens and ovary of *D. bromeliæfolius.*

W. Australia. Swan (or Vasse) River, *Drummond*, *Oldfield*; Vasse River, and Busselton, *Pries.*

Tribe III.—Calectasieæ.—Perianth-segments all rigid, sometimes coloured. Anthers erect. Style subulate, with a small terminal stigma. Flowers rather large.

6. KINGIA, R. Br.

Perianth persistent, of 6 distinct, erect, glumaceous segments, all similar and silky, hairy outside. Stamens 5, hypogynous or 3 slightly adhering to the base of the inner segments and all longer than the perianth; filaments filiform; anthers erect, linear, shortly 2-lobed at the base, the cells opening inwards in longitudinal slits. Ovary sessile, 3-celled, with 1 erect ovule in each cell; style subulate with a minute terminal 3-toothed stigma. Fruit concealed amongst the persistent bracts and perianths, 3-angled, indehiscent. Seeds erect, often reduced to 1 by abortion, obovate; testa membranous; embryo only half included in the base of the fleshy albumen.—Long-lived plant with an erect wooden caudex. Leaves crowded at the summit of the stem, long and very narrow. Peduncles or scapes several, covered with loosely imbricate sheathing bracts. Flowers in a globular terminal head, each one sessile within a persistent bract.

The genus is limited to the single Australian species.

1. **K. australis,** *R. Br. in King. Voy.* ii. 535, *t.* c.—Caudex thick attaining sometimes many feet in height. Leaves 2 to 3 ft. long and only 1 to 2 lines broad in the greater part of their length, spreading or recurved, flat or more or less triquetrous, their edges usually serrulate, becoming glabrous when old, but dilated at the base into a loose sheath which remains densely silky-villous outside. Peduncles several from the tuft of leaves, 6 in. to 1 ft. long, covered with loosely imbricate broad sheathing bracts nearly 1 in. long besides their subulate points, the upper ones crowded and passing into the closely imbricate flowering bracts. Flower-head about 2 in. diameter, the bracts and perianths recurved at the end. Perianth-segments lanceolate, about ¾ in. long

when first out, but lengthening to 1 in. Anthers almost entirely exserted, scarcely broader than the filaments. Ovary and young fruit very densely villous, the ripe fruit only known from Brown's description.—Kunth, Enum. iii. 376; *K. australis* and *K. argentea*, Preiss, Endl. in Pl. Preiss. ii. 52.

W. Australia. King George's Sound, *R. Brown*, and thence to Swan River, *Drummond*, *Preiss*, *n.* 1526, 1527, *Oldfield*, *Harvey*.

7. BAXTERIA, Br.

Perianth persistent, of 6 equal erect long and narrow distinct segments. Stamens 6, attached to the base of the segments and shorter than them; filaments rigid, slightly flattened; anthers long and linear, erect, very shortly 2-lobed at the base, the cells opening inwards in longitudinal slits. Ovary sessile, 3-celled, with 1 erect ovule in each cell; style subulate, rigid, with a small terminal stigma. Capsule obovoid, flat-topped, opening elastically in 6 valves, leaving the dissepiments attached to the axis, the rigid endocarp of each valve detached from the base upwards but remaining attached at the apex, horizontally closing the cells after the seed is ejected. Seeds globular (none remaining in the specimens I have seen.)—Flowers large, sessile and solitary in the centre of the dense tufts of long narrow leaves.

The genus is limited to the single species endemic in West Australia.

1. **B. australis,** *Hook. Lond. Journ.* ii. 492, *t.* 13 *to* 15.—Stock very short, woody, crowned by numerous tufts, of which some consist of leaves only which are erect, linear, 1 to 1½ ft. long, 2 to 3 lines broad in the middle, dilated at the base into broad striate sheaths, the flowering tufts have only 1 or 2 long leaves, passing into sheathing acuminate bracts the length of the perianth. Flowers sessile amongst the bracts, solitary in each tuft, the perianth segments fully 2½ in. long, not 2 lines broad in the greater part of their length, but dilated into broad imbricated bases. Anthers about 1 in. long and the rather longer filaments closely appressed to the inside of the segments. Capsule included in the somewhat enlarged broad bases of the segments; about ½ in. diameter when open.—Endl. in Pl. Preiss. ii. 52.

W. Australia. King George's Sound and to the eastward, *Baxter*, *Drummond* *n.* 303 *and* 464, *Preiss*, *n.* 1525.

8. CALECTASIA, R. Br.

Perianth persistent, hypocrateriform, the tube cylindrical or slightly dilated upwards, the limb of 6 spreading nearly equal lanceolate rigid but coloured lobes. Stamens 6, inserted at the base of the lobes and shorter than them; filaments shortly filiform; anthers linear, erect, shortly lobed at the base, the cells opening in terminal pores sometimes continued in longitudinal slits. Ovary contracted into a very short stipes, narrow, 1-celled, with 3 ovules erect from the centre of the cell; style filiform, with a small terminal stigma. Fruit 1-seeded, oblong or fusiform, indehiscent, enclosed in the slightly hardened tube of the perianth. Pericarp membranous, several-nerved except the smooth apex. Seed oblong with a membranous testa; embryo small, near the base of the fleshy albumen.—Stems woody but slender, branched, covered with leaf-sheaths. Leaves small, linear-subulate. Flowers singly sessile at the ends of the short branches, surrounded by leafy bracts.

The genus is limited to the single Australian species.

1. **C. cyanea,** *R. Br. Prod.* 264, *and in Flind. Voy.* ii. 609, *t.* 9.—Stems usually clustered, erect or ascending, flexuose with short often numerous branches, mostly about 1 ft. high, covered with the sheaths of old leaves, the whole plant more or less pubescent or almost glabrous. Leaves crowded on the short branches, linear-subulate, very acute or pungent-pointed, 4 to 8 lines long, almost 3-quetrous towards the end, flatter below the middle, the persistent sheaths closely embracing the stem, the upper ones passing into the floral bracts. Flowers terminal solitary and sessile. Perianth-tube closely encased in sheathing bracts, shorter than the lobes, almost always pubescent at the base and sometimes all over; lobes blue, often turning reddish-brown in drying, varying from under 4 lines to above 6 lines in length, lanceolate rigid and horizontally spreading both during and after flowering, when old losing their colour or turning brown especially along the centre. Perianth-tube slightly thickened when in fruit, but the flower not otherwise enlarged.—Endl. Iconogr. t. 38 (not quite correct as to the stamens); Walp. Ann. vi. 156; *C. grandiflora*, Preiss in Pl. Preiss. ii. 53; *C. intermedia*, Sond. in Linnæa, xxviii. 222.

Victoria. Grampians, *F. Mueller, Sullivan;* Wimmera, *Dallachy;* Tattiara country, *Woods;* heath west of Glenelg River, *Robertson.*

S. Australia. Robe town, *Herb. F. Mueller.*

W. Australia. Apparently very abundant from King George's Sound to Vasse, Swan, and Murchison Rivers, *R. Brown, A. Cunningham, Drummond,* 1*st. coll. and n.* 446, 779, *and* 780, *Preiss, n.* 1974 *and* 1975, and many others; eastward to Cape Paisley, *Maxwell.*

The species varies very much, in the leaves very short and appressed or much longer and spreading, in the pubescence sometimes confined to the base of the perianth-tube or a little on the back of its lobes, generally rather more copious about the flower, and in some specimens soft and dense over the whole plant, and especially in the size of the flowers. In some northern specimens the lobes are scarcely above 3 lines long and almost obtuse, in the generality of southern and eastern ones, the lobes are 5, 6 or even 7 lines long and very acute, but in a large series of specimens it is impossible to mark out three distinct varieties or species as proposed by Sonder.

TRIBE IV. ENJUNCEÆ.—Perianth small, the segments all free and glume-like. Anthers erect. Style with 3 linear stigmatic branches. Leaves grass-like or terete, mostly radical, or none.

9. LUZULA, DC.

Perianth of 6 equal glume-like segments. Stamens 6, 3 attached to the base of the inner segments, 3 alternate with them, all shorter than the perianth; filaments filiform; anthers oblong or linear, erect, emarginate at the base. Ovary sessile, 1-celled, with 3 ovules erect from a very short central placenta; style single, with 3 usually long and slender stigmatic lobes. Capsule 3-valved. Seeds 3 or fewer by abortion, erect, the very short central placenta usually connected with a slightly raised line in the centre of each valve, globular or ovoid, the testa minutely reticulate-striate with a very thin external hyaline membrane connected with the somewhat dilated funicle and sometimes shortly produced beyond the seed. Embryo small, near the hilum, in an indenture of the almost farinaceous albumen.—Perennial herbs, usually tufted. Leaves grass-like, chiefly radical, often fringed with long fine white hairs. Flowers clustered or distinct, the clusters in irregular unequally branched compound umbels or panicles sometimes contracted into heads, each flower subtended by a scarious bract and enclosed at the base in 1 or 2 broad short scarious bracteoles.

The genus, nearly allied to *Juncus*, is similarly spread over the greater part of the globe, chiefly abundant in temperate regions and more common in woods and pastures than in marshes. Of the three Australian species or varieties, one is cosmopolitan, the two others are endemic, at least in the precise Australian form.

Perianth-segments very acute, 1 to 1½ lines long.
  Leaves 2 to 4 lines broad, with prominent nerve-like margins. Flower-clusters in a dense head above ½ in. diamoter . . . . 1. *L. Oldfieldii.*
  Leaves rarely above 2 lines broad, the nerve-like margins not very prominent. Flower-clusters pedunculate or if all sessile the head scarcely ½ in. diameter . . 2. *L. campestris.*
Perianth-segments subulate-acuminate, 2 to 2¼ lines long . 3. *L. longiflora.*

1. **L. Oldfieldii,** *Hook. f. Fl. Tasm.* ii. 68.—Considered by F. Mueller as a variety of *L. campestris*, but can scarcely be joined with it unless that species be made to include the northern *L. spicata* as well as the South American *L. peruviana* and others generally admitted as distinct. Habit of the compact forms of *L. campestris*, but the tufts more dense and the leaves themselves much broader, varying from 2 to 4 lines, with the nerve-like margin very prominent. Inflorescence very compact, more or less compound, forming an ovoid or almost globular slightly lobed head of ½ to ¾ in. diameter. Perianth-segments very acute, the size of those of *L. campestris* or rather longer. Seeds rather ovoid than globular.

Tasmania. Summit of Mount Wellington, *Oldfield*; a New Zealand plant almost identical with it is referred to the same species by J. D. Hooker.

L. australasica, Steud. Syn. Glum. ii. 294, from Australia, *Durville*, is unknown to me; from the diagnosis given it may be the compact flowering form of *L. campestris*, or, from his comparing it to *L. chilensis*, more probably the same as *L. Oldfieldii.*

2. **L. campestris**, *DC.; Kunth, Enum.* iii. 307.—Stock usually tufted and often knotted with the short hardened bases of the leaves. Stems from a few inches to above 1 ft. high, with a tuft of radical grass-like leaves 2 to 4 in. long, rarely above 2 lines broad, usually bordered by long fine white hairs, and often one leaf higher up, besides a long leafy bract under the inflorescence terminating the stem. Flowers in dense clusters, of which usually 1 or 2 sessile or almost sessile, surrounded by several others on peduncles varying from ½ to 1 in., but sometimes all the clusters collected into a sessile pyramidal head. Bracts shorter than the flowers, usually shining white and contrasting with the brown perianth. Perianth-segments very acute, 1 to 1½ lines long, dark or light brown and often with scarious margins. Capsule very obtuse, not exceeding the perianth.—R. Br. Prod. Addend.; Hook. f. Fl. Tasm. ii. 68; E. Mey. in Pl. Preiss. ii. 48.

Queensland. Armidale, *Parrott.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Woolls* and others; New England, *C. Moore;* Clarence River, *Beckler;* in the interior, *Mitchell, M'Arthur.*

Victoria. From Wendu Vale, *Robertson,* Portland, *Allitt,* Melbourne, *Adamson, F. Mueller* and others, to Genoa River and the Australian Alps generally, *F. Mueller;* Wimmera, *Dallachy.*

Tasmania. Derwent River, *R. Brown;* abundant in pastures throughout the island ascending to 3000 ft., *J. D. Hooker.*

S. Australia. Encounter Bay and ranges around St. Vincent's Gulf, *F. Mueller.*

W. Australia. From near King George's Sound to Swan and Murchison Rivers, *Drummond, n.* 66 *and* 337, *Preiss, n.* 1806, *Oldfield* and others.

This exceedingly variable species, especially in the compactness or looseness of the inflorescence, extends over the temperate or mountain regions of a great part of the globe.

3. **L. longiflora,** *Benth.*—Habit of the luxurious leafy forms of *L. campestris.*—Leaves grass-like, 6 in. to 1 ft. long, the marginal nerve scarcely prominent. Inflorescence as in *L. campestris* compound, the clusters or heads usually rather numerous, more or less pedunculate, or all collected into a compound head of more than 1 in. diameter, surrounded usually by several long leafy bracts. Bracts under the flowers scarious and entire. Perianth-segments subulate-acuminate, 2 to 2½ lines long and 2 or 3 times as long as the capsule.

N. S. Wales. Lord Howe's Island; summit of Mount Lingbird, *C. Moore;* summit of Mount Gower, *Fullagar.* The species is allied to the New Zealand *L. crinita,* but the perianth is much longer than in that or any other species of the genus.

10. JUNCUS, Linn.

Perianth of 6 equal glume-like segments. Stamens either 6, 3 attached to the base of the inner segments and 3 alternate with them, or fewer 1, 2 or all 3 of the inner ones deficient, filaments filiform; anthers oblong or linear, erect, emarginate at the base or almost entire.

Ovary sessile, with 3 parietal placentæ sometimes scarcely prominent, more frequently protruding and sometimes meeting or even connate in the centre, dividing the ovary more or less perfectly into 3 cells; ovules several usually numerous to each cell; style divided usually to the middle into 3 linear or filiform stigmatic lobes often spirally twisted. Capsule 3-valved, the valves usually bearing the placentæ in their centre, or rarely the linear placentæ becoming detached and remaining distinct or cohering in a central column. Seeds very small, usually ovoid, the testa minutely striate-reticulate, with a very thin transparent outer membrane, often scarcely distinct from the testa, but sometimes produced at the end of the seed into a terminal loose appendage often called a tail. Embryo small, near the hilum.—Perennial or rarely annual herbs, the stems usually tufted or crowded on a creeping rhizome. Leaves mostly or all radical, grass-like or terete or sometimes all reduced to sheathing scales. Flowers small in little dense clusters or forked cymes, the clusters or cymes usually several or many, either sessile or nearly so in a dense head, or unequally pedunculate in a simple or branched irregular panicle, really terminating a simple leafless scape with 1, 2 or 3 leafy bracts at the base, but sometimes the inflorescence appears lateral, the bract being terete, but little dilated at the base and strictly erect, forming an apparent continuation of the stem.

The genus is very generally spread over almost all known parts of the world, most abundant in temperate or cool regions, in marshes, maritime sands or wet mountains, but found also in similar situations within the tropics. It is very difficult to decide upon the limits to be assigned to some of the common cosmopolitan species, but taking those limits to be such as here adopted, of the 14 Australian ones, 3 are undoubtedly cosmopolitan, 2 extend to New Zealand and 1 of these also to extra-tropical South America, a 6th cannot be distinguished from a Californian species, a 7th appears to be the same as one from the Mediterranean region, the 7 remaining ones have not as yet been identified with extra-Australian ones, but they may not all prove to be really endemic.

Leaves grass-like and flat or rarely almost terete. Inflorescence terminal with spreading bracts.
Flowers brown, few or many in close clusters.
Stems filiform, leafy for several inches. Flower-heads very small, paniculate. Ovules and seeds few . . 1. *J. gracilis.*
Leaves all radical. Ovules and seeds numerous.
Flower-clusters paniculate (habit of *Luzula*).
Leaves mostly 1 to 3 lines broad. Stamens 3 . . 2. *J. planifolius.*
Leaves rarely above 1 line broad. Stamens 6 . . 3. *J. cæspititius.*
Flower-clusters collected in a dense terminal head. Stamens 6 . . . . 4. *J. falcatus.*
Flowers pale-coloured, in loose cymes or in clusters of 2, 3 or rarely more. Stems under 1 ft. high.
Annual. Flowers mostly distinct, in a much-branched leafy panicle . . . . 5. *J. bufonius.*
Tufted perennial. Flowers clustered (2 to 6), in a slightly branched leafy panicle . . . . 6. *J. homalocaulis.*
Perennial with a creeping rhizome. Flowers distinct in an irregularly dichotomous cyme . . . . . 7. *J. revolutus.*
Leaves terete or nearly so or reduced to sheathing scales.
Panicles apparently lateral below the end of rigid leaf-

less stems (the subtending leafy bract erect and continuing the stem).
Leaves and terminal bract not jointed.
Filaments filiform. Seeds not tailed.
Stamens 3. Scales at the base of the stem usually short.
Flowers distinct in the panicle . . . . 8. *J. communis.*
Flowers all collected into distinct clusters . . . 9. *J. vaginatus.*
Stamens 6. Scales at the base of the stem short or longer than in *J. communis.* Flowers small, distinct in the panicle . . . . 10. *J. pauciflorus.*
Stems very stout and tall with long loose scales at the base. Flowers rather large, distinct in the panicle. Stamens varying 3 to 6 . . . . . . 11. *J. pallidus.*
Filaments short and flat. Seeds tailed. Stems very rigid. Stamens 6 . , ... 12. *J. maritimus.*
Leaves and terminal bracts appearing jointed from internal cross partitions of pith.
Stems more or less flattened usually 1–2 ft. Perianth-segments 1¼ lines with long subulate points. Stamens usually 4 . . . . 13. *J. prismatocarpus.*
Stems 2–7 in. Flower-clusters small and few. Perianth-segments 1 line long, lanceolate, rather acute . . . . 14. *J. capillaceus.*

J. dioicus, Steud. Syn. Glum. ii. 309, from King George's Sound, is insufficiently described for identification, and may not be a *Juncus* at all.

1. **J. gracilis,** *R. Br. Prod.* 259.—Stems filiform, above 1 ft. high, densely tufted at the base although each tuft is never above 2 lines diameter, leafy for several inches, the lower withered leaves having persistent sheaths. Leaves flat and grass-like but very narrow almost filiform, much shorter than the stem. Flowers small, brown, few together (5 to 10 or sometimes only 2 or 3), in little globular clusters sessile at the base of the ramifications of a terminal irregular cyme or at the ends of the filiform very unequal branches, with 1 subulate leafy bract under the inflorescence, the bracts under the clusters and flowers minute. Perianth-segments under 1 line long, the outer lanceolate, the inner ovate. Stamens varying from 3 to 6; filaments filiform; anthers rather long. Ovary completely 3-celled, the placentæ meeting in the centre and apparently cohering, with several but not numerous ovules in each cell. Capsule obtuse, as long as or rather longer than the perianth, the valves bearing the placentæ without leaving a central column. Seeds usually only 1 or 2 in each cell, nearly globular, striate, the funicle rather long.

W. Australia. King George's Sound, *R. Brown*, and probably the same district, *Drummond*, *n.* 103.

Var. *humilis*. Stems under 6 in. high, the inflorescence reduced to very few or sometimes to a single cluster.—Karri Dale, *Walcot*.

2. **J. planifolius,** *R. Br. Prod.* 259.—Stock tufted. Leaves radical, usually numerous, flat and grass-like, shorter than the stem, 1 to 3 lines or rarely nearly 4 broad, with long imbricating sheaths almost

distichous, the whole habit nearly that of some varieties of *Luzula campestris*. Stems leafless, usually 1 to 1½ ft. high, but sometimes much lower, with a terminal compound unequally branched cyme, the lower branches often clustered. Bracts all small and scarious, or rarely 1 or 2 leafy ones at the base of the inflorescence. Flowers brown, in globular clusters at the base of the ramifications and ends of the branches. Perianth-segments but little more than 1 line long, very acute. Stamens 3. Ovary with 3 parietal placentæ only very shortly connected at the base and numerous ovules, Capsule mucronate or scarcely acuminate, about as long as the perianth. Seeds ovoid, very small, the minute reticulations visible only under a ¼ in. lens.—Hook. f. Fl. Tasm. ii. 64.

N. S. Wales. Port Jackson, *R. Brown*, *Sieber*, *Woolls* and others; New England, *C. Stuart*; Macleay River, *C. Moore*.

Victoria. Port Phillip, *F. Mueller*; Wimmera, *Dallachy*.

Tasmania. Table Mountain (Mount Wellington), *R. Brown*; abundant throughout the island, *J. D. Hooker*.

S. Australia. Lofty ranges and others round St. Vincent's Gulf, *F. Mueller*.

W. Australia. King George's Sound and neighbouring districts, *Maxwell*, *F. Mueller*, *Drummond*, *n.* 208, 366, and others.

Var. *tenella*. Stems mostly under 6 in., very slender, with very narrow leaves. Flower-heads small with few flowers, but not so small as in *J. gracilis*. Flowers triandrous and capsules shortly mucronate as in the typical *J. planifolius*.—Mount M'Ivor, *F. Mueller*.

3. **J. cæspititius**, *E. Mey. in Pl. Preiss.* ii. 47 *and in Linnæa* xxvi. 244.—The larger specimens sometimes much resemble *J. planifolius*, but the leaves are always much narrower and the stamens appear to be constantly 6. Leaves usually densely tufted, the broadest but little more than 1 line or in very luxuriant specimens a few of them nearly 2 lines broad just above the sheath, all more erect than in *J. planifolius*, usually convolute towards the end and often almost subulate. Stems rarely much above 1 ft. high. Inflorescence when much developed the same as in *J. planifolius*, but the flowers rather larger, the inner segments entirely excluding the outer before expansion and enclosing the 6 stamens. Placentas parietal with numerous ovules, and seeds tailless and smooth unless under a high power as in *J. planifolius*. Capsule rather shorter than the perianth and almost obtuse.—Hook. f. Fl. Tasm. ii. 64.

Victoria. Wendu Vale, *Robertson*; Snowy River, *F. Mueller*.

Tasmania. In the northern parts of the island, *J. D. Hooker*.

S. Australia. St. Vincent's Gulf, *F. Mueller*.

W. Australia. Swan River, *Drummond*, *1st coll. and n.* 336, 937; *Preiss*, *n.* 1733 Murchison River, *Oldfield*.

4. **J. falcatus**, *E. Mey. Syn. Luzul.* 34, *and in Linnæa*, xxvi. 245.—Rhizome stoloniferous Leaves at the base of the stem flat, grass-like, shorter than the stem, mostly 1 line broad or rather more. Stems 6 in. to 1 ft. high, bearing usually 1 leaf at or above the middle and a single

terminal head of flowers surrounded by scarious bracts, or rarely a second head lower down in the axil of a leafy bract. Flower-head (composed of condensed cymes) usually 3 to 4 lines diameter when in flower, twice that when in fruit, the scarious bracts all shorter than the flowers or rarely the outermost one produced into a leafy point. Perianth-segments brown, about 2 lines long, the outer ones very acute, the inner less so. Stamens 6. Placentas parietal, with many ovules. Capsule obtuse, about as long as the perianth, dark and shining. Seeds obovoid or oblong, brown, obtuse or rarely with a very small white apiculus, marked with numerous fine longitudinal reticulations.—Hook. f. Fl. Tasm. ii. 64; Engelm. in Trans. Acad. Sc. St. Louis, ii. 452, 495; *J. agrostophyllus*, F. Muell. in Linnæa, xxvi. 245.

Victoria. Snowy River, Mitta-Mitta, Cobberas and other ranges of the Australian Alps, *F. Mueller.*

Tasmania. On all the mountainous parts in wet places, *Gunn*, *Archer* and others.

E. Meyer originally described the species from Californian specimens with which he afterwards identified the Australian ones. Engelmann had in the first instance distinguished the latter under the name of *J. tasmanicus*, chiefly from some slight difference in the reticulation of the seeds which he subsequently recognised as not of specific importance. In the specimens I have examined I find the seeds generally narrower and the transverse lines connecting the longitudinal ones fewer and less prominent in the Californian than in the Australian ones, but sometimes there is more difference in the seeds of 2 capsules from the same country than in others from 2 capsules of the 2 countries.

5. **J. bufonius**, *Linn.; Kunth, Enum.* iii. 353.—A pale-coloured tufted annual, rarely exceeding 6–8 in. and often scarcely half that size, the stems erect, slender and branching, with a linear leaf or leafy bract under each branch. Leaves linear, from almost filiform to nearly 1 line broad, the margins involute at least in the dried state, the lower ones sometimes exceeding the stem, all dilated at the base into a rather long sheath. Flowers nearly sessile, solitary or in clusters of 2 or 3, terminal or sessile in the forks of a loose dichotomous leafy cyme. Bracts broadly ovate, thinly scarious, subtending each flower with 2 similar bracteoles immediately under the perianth. Perianth-segments pale coloured, narrow, acuminate and very acute, mostly about 3 lines long, but variable in size, the inner ones rather smaller than the outer. Stamens 6 or rarely only 3. Capsule oblong, shorter than the perianth, the placentas usually at length detached from the valves and either cohering in a central column or ultimately separating. Seeds minute and numerous, without tails.—E. Mey. in Pl. Preiss. ii. 47; Hook. f. Fl. Tasm. ii. 64; *J. plebeius*, R, Br. Prod. 259.

N. S. Wales. Port Jackson, *C. Moore*, *Woolls*, and others.

Victoria. Wendu Vale, *Robertson;* about Melbourne, *Adamson*, *F. Mueller* and others; Wimmera, *Dallachy*.

Tasmania. Abundant in moist places throughout the colony, *J. D. Hooker*.

S. Australia. St. Vincent's Gulf to Rivoli Bay, and the Murray, *F. Mueller*, *Behr*.

W. Australia. King George's Sound to Swan and Murchison Rivers, *Drummond*, *Oldfield*, *Preiss*, *n.* 1734, and others.

The species is a common weed in most temperate regions of the globe.

6. **J. homalocaulis,** *F. Muell. in. Herb. Hook.*—A small tufted pale-coloured species apparently perennial, but without the creeping rhizome of *J. revolutus*. Stems rarely exceeding 6 in., slender, the inflorescence but little branched. Leaves from the base of the stem very narrow and almost terete and shorter than the stem. Flowers 2 to 6 together in clusters or heads sessile or pedunculate towards the end of the stem, with a subulate leafy bract under the lowest cluster, the flowers sessile in the clusters and generally divaricate, at least after flowering and the clusters few to each stem. Perianth-segments rigid, acutely acuminate, about 3 lines long, the inner ones rather shorter. Stamens 6. Style divided nearly to the base. Placentas parietal, not very prominent. Capsule rather shorter than the perianth. Seeds ovoid, without tails.—*J. plebeius*, Steud. Syn. Glum. ii. 307 and some others, but not of R. Br.

N. S. Wales. Port Jackson, *C. Moore*, *Woolls*; New England, *C. Stuart*.
Victoria. Glenelg River, *Robertson*; Black Forest, *F. Mueller*; Wimmera, *Dallachy*.

This was supposed to have been the *J. plebeius* of Brown and is united by F. Mueller with the *J. revolutus* under the name of *J. Brownei*. It appears to me however to be quite distinct in habit as well as in inflorescence from that species, and to approach nearer to *J. bufonius*, to which *J. plebeius* proves to be referrible.

7. **J. revolutus,** *R. Br. Prod.* 259.—Stems from a creeping rhizome erect, simple below the inflorescence, from 2 or 3 in. to nearly 1 ft. high. Leaves mostly shorter than the stem, all from its base or a single one higher up, all very narrow, the midrib prominent underneath and the thickened margins often recurved especially towards the end. Flowers singly sessile along the branches or in the forks of an irregularly branched terminal dichotomous cyme, with 1 or 2 leafy bracts at the base of the cyme, small glumaceous ones under the forks, and short broad almost scarious ones under each flower. Perianth-segments narrow, pale-coloured, acute, thick and rigid, with scarious margins, 2½ to nearly 3 lines long. Stamens 6. Placentas parietal, prominent but not uniting with each other except at the very base. Capsule obtuse, shining, as long as the perianth or rather shorter. Seeds ovoid, without tails.—Hook. f. Fl. Tasm. ii. 65; *J. Brownei*, F. Muell. in Linnæa, xxvi. 245, Fragm. ix. 78, partly.

Victoria. Yarra and Snowy Rivers, *F. Mueller*.
Tasmania. Port Dalrymple, *R. Brown*; near the sea, Georgetown, *Gunn*; on the Tamar, *C. Stuart*.

8. **J. communis,** *E. Mey. Syn. Junc.* 12.—Stems densely tufted on a horizontal or shortly creeping matted rhizome, usually 2 to 3 ft. high, or even more, erect, terete, leafless except a few brown or pale-

coloured leafy sheathing scales at the base. Panicle apparently lateral and sessile at from 2 or 3 to 6 or 8 in. below the top, the leafy bract at the base of the inflorescence being erect, terete, continuous with the stem, and scarcely hollowed into a sheath at the base. Flowers numerous, densely crowded into a compact globular head of ½ in. diameter or forming a looser very unequally branched panicle of 1 to 2 in. diameter flowering from the base, the central short branches having only 2 or 3 flowers, the others a considerable number, usually singly scattered along the branches of irregular cymes. Bracts within the panicle small and scarious. Perianth nearly or quite sessile, the segments all very acute, usually pale-coloured, above 1 line and under 1½ lines long. Stamens in all the flowers examined 3 only, alternating with the inner segments. Capsule narrow-ovoid or elliptical, obtuse, as long as or rather longer than the perianth. Placentas very prominent and often meeting in the centre but not united except at the base. Seeds very numerous, minute, without tails.—Hook. f. Fl. Tasm. ii. 67 ; *J. effusus*, Linn. ; R. Br. Prod. 258.

Australia. Apparently abundant wherever there are marshes or habitually wet places, especially without the tropics, the special localities recorded from each colony are far too numerous to be worth enumerating, the species extending also to most temperate and sub-tropical regions of the globe. In Australia as elsewhere there are two principal varieties, the *J. conglomeratus*, Linn., with the flowers closely packed in a dense head and usually more or less brown, and *J. effusus*, Linn., with the panicles looser and paler coloured, but every gradation may be observed between the two. The former is not so common in Australia as the looser flowered one, but I have seen specimens from all the colonies in the herbaria of F. Mueller or of Kew.

J. australis, Hook. f. Fl. Tasm. ii. 66, t. 134, and *J. pallidus*, Hook. f. l. c. and probably Kunth, Enum. iii. 321, but not of R. Br., appear to me to be entirely referrible to forms of *J. communis*.

9. **J. vaginatus,** *R. Br. Prod.* 258.—This has the stems with sheathing scales at the base and the continuous terete terminal leafy bract of *J. communis*, but the panicle is looser with rather long branches, and the flowers in little dense distinct cymes almost contracted into clusters at the base of the ramifications and ends of the branches, almost as in *J. prismatocarpus*. Perianths small and stamens 6 as in *J. pauciflorus*.

N. S. Wales. Port Jackson, *R. Brown*. I have seen it in no other collection. The southern and western large species usually taken for Brown's *J. vaginatus* is his *J. pallidus*.

10. **J. pauciflorus,** *R. Br. Prod.* 259.—Stems in the typical form crowded on a horizontal or shortly creeping rhizome and under 1 ft. high, but attaining in other specimens 2 or 3 ft., leafless except a few sheathing scales at the base, of which the innermost is often several inches long and sometimes produced into a leafy point of 1 or 2 in. Inflorescence lateral as in *J. communis*, the leafy bract at its base terete and continuous, erect and terminating the stem. Panicle irregularly compound resembling that of the loose-flowered varieties of *J. communis*,

but usually more slender, the flowers few or numerous rather smaller than in that species, and six stamens in all the flowers examined. Ovary, capsule, and seeds of *J. communis*.—Hook. f. Fl. Tasm. ii. 67.

Queensland. Moreton Bay, *F. Mueller*, and others; Rockhampton, *Thozet*.

N. S. Wales. Port Jackson, *R. Brown*, *Woolls* and others; Macleay River, *Beckler*, *C. Moore*; Richmond River, *Mrs. Hodgkinson*; New England, *C. Stuart*.

Victoria. From Portland, *Green*, and Mount William, *Sullivan*, to the Baw-Baw and Cape Otway ranges and Snowy River, *F. Mueller*.

Tasmania, *R. Brown*; abundant throughout the colony, *J. D. Hooker*.

S. Australia. Ranges bordering St. Vincent's Gulf and Torrens River, *F. Mueller* and others.

J. Gunnii, Hook. f. Fl. Tasm. ii. 67, appears to me to be a slight variety of *J. pauciflorus*. of small size, with dark brown bracts and perianths, which are usually but not always very pale in the typical forms.

11. **J. pallidus**, *R. Br. Prod.* 258.—A tall stout species, very nearly allied to the loose-flowering varieties of *J. communis*. Stems several feet high, the sheathing scales enclosing their thick base long and loose, the innermost often 6 to 10 in. long and tapering into a long point. Inflorescence lateral like that of *J. communis*, but more rigid and the flowers usually rather longer. Stamens usually 3, but occasionally varying to 4 or 5 and perhaps sometimes 6.—*J. vaginatus*, E. Mey. in Pl. Preiss. ii. 46; Hook. f. Fl. Tasm. ii. 68, not of R. Br.; *J. correctus*, Steud. Syn. Glum. ii. 296.

Queensland. Plains of the Condamine, *Leichhardt*.

N. S. Wales. A few specimens from various collections as well as the above-mentioned plant of Leichhardt's appear to be referrible to this species, but are somewhat doubtful.

Victoria. French Island, *Beveridge*; Ararat, *Green*, and a few other stations.

Tasmania. Common in many parts of the island, both north and south, *J. D. Hooker*.

S. Australia. In numerous localities about St. Vincent's Gulf, *F. Mueller* and others.

W. Australia. King George's Sound, *R. Brown*, and thence to Swan River, abundantly, *Drummond*, *n.* 319 *and* 367, *Preiss*, *n.* 1864, and many others.

The four preceding species might be regarded as varieties of one, which however in that case should include many forms from other countries generally adopted as distinct species.

12. **J. maritimus**, *Lam.*; *Kunth*, *Enum.* iii. 322.—Stems densely tufted on a horizontal or shortly creeping rhizome, very rigid, 2 to 3 feet high, with sheathing scales at the base, of which 1 or 2 inner ones terminate in a rigid terete pungent stem-like leaf shorter than the real stems. Panicle or cyme appearing lateral, the long outer leaf-like bract erect and continuing the stem but more distinct than in *J. communis*, owing to its broad sheathing base. Flowers in little clusters usually very numerous in an irregularly

compound panicle sometimes very dense, sometimes looser with 1 or 2 of its branches elongated to several inches. Perianth-segments about 1¼ lines long, the outer ones very acute, the inner with broad scarious margins. Stamens 6, the filaments short and broad. Capsule not exceeding the perianth, almost completely 3-celled. Seeds oblong, variable in size and number, the outer membrane almost always produced at both ends into short tails.—R. Br. Prod. 258; E. Mey. in Pl. Preiss. ii. 46; Hook. f. Fl. Tasm. ii. 66.

Queensland. Rockhampton, *O'Shanesy* and others.

N. S. Wales. Paramatta, *Woolls;* Hastings River, *Beckler.*

Victoria. Melbourne, *Adamson ;* Gipps' Land, *F. Mueller.*

Tasmania. Common in salt and brackish marshes, sometimes on moist sand hills, *J. D. Hooker.*

W. Australia. King George's Sound and Lucky Bay, *R. Brown,* thence to Swan River, *Drummond, n.* 194, 339 ; *Preiss, n.* 1865, *Oldfield.*

The species is common in maritime marshes and moist sands in most temperate regions. The flowers in the Australian specimens are usually rather smaller and darker coloured and the inflorescence more dense than in the northern ones. Drummond's n. 338 is a remarkably large stout form, with the stem and leaves nearly 2 lines diameter and the base of the stem with its sheaths 4 to 5 lines diameter, but the flowers and fruits those of the typical *J. maritimus.*

In Herb. F. Mueller are two imperfect specimens of the northern *J. acutus,* labelled as from Sieber's Australian collection, but probably by some error. They have not Sieber's printed labels, and no other specimens from the southern hemisphere are known.

13. **J. prismatocarpus,** *R. Br. Prod.* 259.—Stems tufted or stoloniferous and shortly creeping at the base, 1 to 2 ft. high, more or less compressed. Leaves few, erect from long sheaths, compressed or nearly terete, hollow inside but divided by cross partitions of pith giving them a jointed appearance. Panicle terminal, erect, compact or divaricate with long branches, with 1 or 2 erect leafy bracts at its base, jointed like the leaves. Flowers numerous in globular clusters terminating the branches or sessile at their base. Perianth-segments very narrow, with subulate points, about 1½ lines long, the inner ones rather broader. Stamens usually 3, but sometimes 4 to 6, the filaments slender. Capsule narrow, with very prominent acute angles, from a little shorter to considerably longer than the perianth, the parietal placentæ scarcely prominent inside. Seeds minute, without tails.—*J. holoschœnus,* R. Br. l. c.; Hook. f. Fl. Tasm. ii. 65; *J. commutatus,* Steud. Syn. Glum. ii. 301.

Queensland. Moreton Bay, *Eaves;* Armidale, *Perrot;* Broad Sound *Gulliver.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Sieber, n.* 431 and many others; New England, *C. Stuart;* Macleay River, *C. Moore;* Clarence River, *Beckler, Wilcox.*

Victoria. Wendu Vale and Glenelg River, *Robertson ;* Melbourne, *F. Mueller.*

Tasmania. Abundant in marshy places throughout the island, *J. D. Hooker.*

S. Australia. St. Vincent's Gulf, *Behr, F. Mueller* and others.

W. Australia. King George's Sound to Swan and Murchison Rivers, *Drummond, n.* 54, 114, 233, 323, *Oldfield* and others.

J. striatus, Schousb. from the Mediterranean regions is scarcely distinguishable from *J. prismatocarpus* except by the rather smaller flowers, and *J. oxycarpus*, E. Mey. from South Africa appears to be quite identical.

14. **J. capillaceus,** *Hook. f. Fl. Tasm.* ii. 65, *t.* 134.—Stems from a tufted or shortly creeping branching base erect, leafy, only 2 to 3 in. high. Leaves very narrow or subulate, nearly terete, more or less distinctly divided inside by cross partitions of pith as in *J. prismatocarpus*, sometimes shorter than but often twice as long as the stem. Flowers in little clusters of 3 to 10, rarely reduced to single flowers, and often not above 3 or 4 clusters to the small panicle, the lowest bract usually elongated and leafy, the other bracts small. Perianth-segments about 1 line long, lanceolate with scarious margins, rather acute but without the subulate points of *J. prismatocarpus*. Stamens 6. Capsule as long as or shortly exceeding the perianth, obtusely angular and shortly beaked. Placentas scarcely prominent. Seeds without tails.

N. S. Wales. Timbarra, New England, *C. Stuart.*

Victoria. Rivulets of the Black Mountains and Cobra Range, ascending to 5 or 6000 ft. *F. Mueller.*

Tasmania. Arthur's Lake, *Gunn*; Cuming's Head, *Archer*; Coal River Tier, *Oldfield.*

The species is also in New Zealand.

ORDER CXXXIII. PALMÆ.

Flowers unisexual or rarely hermaphrodite. Perianth inferior and persistent in the females, of 6 usually dry or rigid segments in 2 series, the outer ones usually imbricate or united in a 3-toothed or 3-lobed cup, the inner usually longer, valvate in the males, valvate or imbricate in the females. Stamens in the males 3, 6, or indefinite, attached to the receptacle and often surrounding a rudimentary or imperfect ovary; filaments usually short; anthers erect attached at the base or shortly above the base and somewhat versatile, with 2 parallel cells opening inwards in longitudinal slits. Staminodia in the females when present and stamens in the hermaphrodite flowers usually 6, attached to the base of the perianth. Ovary in the females superior, either 3-celled or divided into 3 distinct carpels, or in some genera 1-celled from the first and in many genera only 1 cell fertile. Style usually very short or completely divided into 3 short thick stigmas or lobes stigmatic inside, at first erect afterwards spreading, rarely columnar with 3 small terminal stigmas. Ovules solitary or rarely 2 in each cell or carpel, erect and anatropous or rarely laterally attached or pendulous and amphitropous or orthotropous. Fruit an indehiscent drupe or berry, the exocarp often thick succulent fleshy or spongy and fibrous, sometimes thin and hard, the endocarp membranous crustaceous or hard and bony. Seed solitary or sometimes 2 or 3; testa thin or crustaceous, adnate to the albumen or sometimes more or less to the endocarp; hilum orbicular oblong or shortly linear, basal and oblique or rarely lateral or terminal, the raphe sometimes variously ramified. Albumen hard cartilaginous or white and brittle, entire ruminate or excavated on one side. Embryo small in a small cavity either basal and near the hilum or dorsal and more or less distant from it.—Woody plants either with long weak or climbing stems and alternate leaves, or with an erect stem or caudex often very tall with a terminal crown of large leaves which in decaying leave the stem covered with scales or fibres, or marked with annular scars. Leaves large, either pinnately or palmately divided into long lobes or segments, rarely bipinnate. Flowers usually numerous and small for the plant, in simple spikes or branched panicles called *spadices*, usually pendulous and arising from amongst the leaves or from the trunk below them, and at first entirely enclosed in a large bract called a *spatha*, opening laterally and finally deciduous with frequently 1 or more smaller sheathing bracts below the spatha, and rarely none but sheathing bracts below or on the rhachis of the spadix. Flowers usually sessile along the rhachis or branches of the spadix, often especially the males 2 together from the same node or notch, subtended by 1 or 3 small bracts not unfrequently reduced to a slightly raised margin of the node.

This splendid order, the pride of all tropical regions, is restricted in Australia to few species and almost confined to Arnhem's Land and Queensland, only four species extending into New South Wales, one of them penetrating as far south as Gipps' Land, besides three species endemic in Lord Howe's Island. None of the Australian genera but the majority of the species are endemic, most of them congeners and nearly allied to the Palms of the Malayan Archipelago or of New Caledonia.

Climbing palms, with alternate prickly pinnate leaves. Flowers diœcious. Perianth-segments all valvate. Fruit covered with imbricate scales. Embryo basal . 1. CALAMUS.
Erect palms, with a terminal crown of simply pinnate leaves. Flowers monœcious. Outer perianth-segments imbricate.
  Inner perianth-segments valvate in the males, imbricate in the females. Embryo basal.
    Ovary 1-celled. Ovule erect. Albumen entire.
      Fruit usually ovoid. Remains of the style terminal . 2. KENTIA.
      Fruit obliquely globular. Remains of the style excentrical or lateral . . . . 3. CLINOSTIGMA.
    Ovary 1-celled. Ovule pendulous. Albumen ruminate 4. PTYCHOSPERMA.
    Ovary 1-celled. Ovule erect. Albumen ruminate . . 5. ARECA.
    Ovary 3-celled. Ovule erect. Fruit large. Albumen entire. . . . . 6. COCOS.
  Inner perianth-segments valvate in both sexes.
    Ovary 3-celled. Albumen entire. Embryo dorsal. . 7. ARENGA.
Erect palms, with bipinnate leaves. Inner perianth-segments valvate in both sexes. Ovary 3-celled. Albumen ruminate. Embryo dorsal . . . . 8. CARYOTA.
Erect palms, with a terminal crown of fan-shaped leaves. Flowers hermaphrodite. Perianth-lobes or segments all valvate. Stamens 6. Embryo dorsal.
  Filaments united at the base in a cup or ring. Leaf-lobes truncate and toothed at the end . . . . . 9. LICUALA.
  Filaments very broad at the base and contiguous but free. Leaf-lobes acuminate . . . . 10. LIVISTONIA.

1. CALAMUS, Linn.

Flowers diœcious, distichous and sessile along the spike-like branches of the panicle. Outer perianth 3-lobed, inner of 3 segments, the lobes or segments all valvate in both sexes. Stamens in the males 6, round a rudimentary ovary. Staminodia in the females 6. Ovary 3-celled, with 1 erect ovule in each cell. Stigmas 3, sessile or on a very short style. Fruit globular, closely covered with reflexed imbricated shining scales. Seed usually 1 only, nearly globular, obliquely attached towards the base, testa thin. Albumen hard, entire. Embryo basal or nearly so.—Prickly palms, with weak stems often climbing to a great height. Leaves simply pinnate, the rhachis and sheaths usually armed with hooked or straight prickles, and in some species not Australian ending in a simple armed tendril. Flowers small, the spikes in partial panicles, few or numerous, in a loose general panicle proceeding from a narrow prickly sheath or spatha, and often from the base of the panicle or from a leaf-sheath below it proceeds a long prickly simple thong or *lorum*, probably an abortive branch of the inflorescence.

The genus is chiefly abundant in tropical Asia, extending also into tropical Africa. The Australian species are as far as known endemic, but require further comparison with some little known ones from the Malayan Archipelago.

Leaf-segments acuminate and entire with smooth edges . . 1. *C. australis.*
Leaf-segments more or less scabrous on the edges with minute distant prickles, and often sprinkled underneath with straight prickles or bristles.
  Leaf-segments acuminate and entire, under 1 in. broad . 2. *C. Muelleri.*
  Leaf-segments hooked or jagged at the end, 1 to 2 in. broad . . . . 3. *C. caryotoides.*

1. **C. australis,** *Mart. Hist. Nat. Palm.* iii. 342.—A slender reclining palm (*A. Cunningham*), climbing to a great height (*F. Mueller*). Leaves often above 2 ft. long, the rhachis armed underneath with short conical recurved prickles, scattered in the lower part, distant in a single row towards the upper end, the upper side of the petiole and lower part of the rhachis armed with straight prickles or bristles mostly turned upwards; segments 10 to 20, the lower ones often 1 ft. long and 1¼ in. broad, the upper ones smaller, all shortly acuminate and entire, the edges smooth and the surface without prickles. Panicles long and loose, the main rhachis armed with recurved prickles and long lora armed with recurved prickles, the partial panicles almost or quite recurved. Male spikes 1 to 1½ in long, the flowers closely distichous within broadly ovate acute bracts of about 1 line. Outer perianth thick, obtusely lobed, about 1½ lines long, inner longer, on a short stipes, the segments narrow and thinner. Female spikes 3 to 4 in. long, the flowers more distant. Fruit globular, 4 to 5 lines diameter. —Wendl. and Drude in Linnæa, xxxix. 197; *C. obstruens*, F. Muell. Fragm. v. 48.

Queensland. Shaded woods, Fitzroy Island, *A. Cunningham, M'Gillivray;* Rockingham Bay, *Dallachy.*

This species was comprised by Martius amongst those which were insufficiently known enumerated *after* his 4th and last division of the genus, but incautiously placed by Wendland and Drude *under* that division, characterised by the presence of both lora and tendrils terminating the leaves; the *C. australis* has lora but no leaf tendrils.

2. **C. Muelleri,** *Wendl. and Drude in Linnæa*, xxxix. 193.—Stem covered with closely appressed or adnate leaf-sheaths very densely armed with straight slender prickles or bristles. Leaves in our specimens from under 1 ft. to 1½ ft. long, with 10 to 16 segments, the longest 8 in. long and ¼ in. broad, all shortly acuminate, the margins scabrous with a few minute hooked prickles, and the under surface occasionally sprinkled with a few slender straight prickles or bristles, the rhachis armed with scattered hooked or reflexed prickles. Main rhachis of the inflorescence often very long slender and armed with recurved prickles, bearing a few distant simple panicles of 2 or 3 in. each with 3 or 4 to 10 or 12 branches or spikes and almost or quite unarmed. Lora slender, 1 to 2 ft. long, with numerous hooked prickles. Outer perianth-segments in the males 1 line, inner segments 2 lines long. Stamens inserted on a thick disk. Staminodia in the females of the shape of the perfect stamens, the filaments shortly united in a ring, the anthers without pollen. Fruit globular, 5 to 6 lines diameter.

Queensland. Brisbane River, *F. Mueller.*
N. S. Wales. Clarence River, *Beckler;* Richmond River, *Henderson.*

C. radicalis, Wendl. and Drude in Linnæa, xxxix. 195, is described only from a single leaf or rather a portion of a leaf and a lorum, closely resembling those of *C. Muelleri*, except that the leaf is at least 2½ ft. long and has 42 segments. There is nothing to show whether it be the leaf of a barren luxuriant stem of *C. Muelleri* or that of a distinct species.—North of Port Mackay, *Nernst.*

3. **C. caryotoides,** *Mart. Hist. Nat. Palm.* iii. 338.—Branches and adnate sheaths armed with straight prickles and bristles like those of *C. Muelleri* but much shorter. Leaves the same length and similarly armed, but the segments mostly broader some as much as 2 in. broad, truncate and toothed or jagged at the end, the edges scabrous with minute prickles as in *C. Muelleri*. Inflorescence long and loose, but the partial panicles not distant as in that species.—Fruits much smaller, not above 3 lines diameter in our specimens, but perhaps not full grown.

Queensland. Endeavour River and Bloomfield Rivulet between that and Cape Grafton, "Ground Palm," *A. Cunningham.*

2. KENTIA, Blume.

(Linospadix, Grisebachia, Hydriastele, and Hedyscepe, *Wendl. and Drude;* Kentiopsis, *A. Brongn.*)

Flowers monœcious in the same spadix, sessile in the notches of a simple or branched rhachis, usually 2 males in each notch, and a female one later developed in the same notch, the upper males sometimes solitary, Male flowers: Outer perianth of 3 imbricate broad or narrow segments, inner longer of 3 valvate segments. Stamens 6 to about 20, inserted on a thick disk or receptacle, without any or with a small rudimentary ovary in the centre; anthers oblong or linear, longer or rarely shorter than the filaments. Female flowers: Perianth-segments of both series broad and imbricate, the inner not much longer or rarely shorter than the outer. Staminodia none or small. Ovary 1-celled, with 1 ovule erect from the base but excentrically attached. Stigmas 3, at first erect and connivent, at length spreading. Drupe ovoid or ellipsoid; exocarp fleshy and succulent or when dry hard and fibrous; endocarp usually thin. Seed erect, the hilum oblique or more or less lateral; testa thin often adhering more or less to the endocarp, leaving the albumen marked with the ramifications of the raphe but quite entire, not ruminate.—Small or tall erect palms, the caudex marked with annular scars. Leaves in a terminal crown, long and pinnately divided, the segments acuminate and entire or jagged or toothed at the end. Inflorescence at the base of the leaves long and simple or branched, at first enclosed in a rather thin spatha.

Besides the Australian species which are all endemic there are a few from the Indian Archipelago and New Caledonia. The genus has however been variously extended or restricted by different phœnicologists. I have followed in its delimitation the views of F. Mueller, which appear most in conformity with those of Blume, although in the original species the male flowers are hexandrous. In the Australian species the number of stamens varies considerably but always more than 6, they would therefore be referrible to A. Brongniart's genus *Kentiopsis* (Comptes Rendus, 1873) which appears to me to be too artifically separated fom *Kentia*.

Spadix a long and simple spike within the spatha.
  Rhachis slender, slightly notched.
    Flowers rather distant, the males 3 to 4 lines long. Stamens about 10. Fruit ovoid-globular ½ in. long . . . 1. *K. monostachya.*
    Flowers approximate, the males 1½ lines long. Stamens about 12. Fruit (unripe) cylindrical 8 lines long . . . . 2. *K. minor.*
  Rhachis thick, deeply notched. Stamens about 20. Fruit ovoid-oblong above 1 in. long . . . . . 3. *K. Belmoreana.*
Spadix branched. Rhachis slightly notched.
  Spikes or branches long slender and pendulous. Fruit ovoid-globular 4-5 lines long . . . . 4. *K. Wendlandiana.*
  Spikes or branches spreading. Stamens 10 to 12. Fruit ovoid-oblong above 1 in. long . . . . . 5. *K. Canterburyana.*
Insufficiently known species . . . . 6. *K. acuminata.*

1. **K. monostachya,** *F. Muell. Fragm.* vii. 82.—Stem 6 to 12 ft. high (*A. Cunningham*). Leaves 1½ to 4 ft. long, the sheathing base broad, coriaceous, about 6 in. long, produced into 2 stipule-like lobes, segments very irregular, acuminate, very variable in breadth and distance, adnate to the rhachis or tapering at the base, the longest about 1 ft. long. Inflorescence a pendulous undivided slender spike of great length, the peduncle below the spatha 1½ to 2 ft. long, enclosed at the base to nearly half its length in a sheath, the spike itself 1 to near 2 ft. long, enclosed in a membranous spatha at length open along one side, the rhachis slender; notches scarcely indented, the margins or bracts very slightly prominent, and not very close together. Male

perianth when fully out 3 to 4 lines long, the outer broad segments about 1 line diameter. Stamens about 10, with very short filaments. Female perianth: outer segments as in the male, inner as broad but larger. Ovary 1-celled, with 1 erect ovule. Fruit ovoid or nearly globular, about ½ in. long, the succulent pericarp not very thick. Testa of the seed adhering to the thin endocarp.—*Areca monostachya*, Mart. Hist. Nat. Palm. iii. 178; *Linospadix monostachyos*, Wendl. and Drude in Linnæa, xxxix. 198.

Queensland. Cape York Peninsula, *Hann's Expedition*; Wide Bay, *Leichhardt*; Maroochio, *Bernays*.

N. S. Wales. Mount Lindsay, *W. Hill*; New England, *C. Stuart*; Clarence and Hastings Rivers, *Beckler*; Clarence River, *Wilcox*; Macleay River, *Fitzgerald*; Richmond River, *Mrs. Hodgkinson*. "Walking-Stick Palm."

2. **K. minor,** *F. Muell. Fragm.* viii. 235.—"Stems several from the same rhizome, 2 to 5 ft. high, ½ in. thick. Leaves attaining 3½ ft.;" segments 12 to 14, 6 to 10 in. long, acuminate or more frequently toothed or jagged at the end, the lower ones ½ to ¾ in. broad, the upper ones broader, the terminal ones confluent at the base and about 2 in. broad. Spikes in the specimens simple, slender, 6 to 9 in. long on a peduncle at least as long, scarcely above 1 line thick, with the scar of the fallen spatha a little below the spike, the rhachis not thicker, the notches slightly indented and close together. Male perianth in the specimens nearly 1½ lines long but perhaps not fully out, the outer segments very short. Stamens about 12, the filaments not much shorter than the anthers. Female perianth shorter than in the males the inner segments about twice as long as the outer. Ovary oblong, fleshy, with 1 erect ovule. Fruit "in an unripe state cylindrical, 8 lines long, 1 line thick, tapering at each end. Seed ½ in. long, the albumen not ruminate."

Queensland. Moresby and Russell Rivers and Bellenden Range, *W. Hill*; Daintree River, *Fitzalan*. Of the fruit I have only seen fragments.

3. **K. Belmoreana,** *F. Muell. Fragm.* vii. 99; viii. 234.—Stems attaining 35 ft. Leaves 6 to 8 ft. long with numerous acuminate segments. Inflorescence of long and thick simple nodding or pendulous spikes, said to attain 5 ft. and 2 to 3 ft. long on a peduncle of 1 ft. in the specimens seen, each enclosed in a rather thin spatha at length open on one side, but ending in an entire flattened solid point of 2 to 3 in. Rhachis at least ½ in. diameter with a triple spire of deeply excavated notches closely crowded with raised margins. Male perianth broadly oblong or ovoid, about 4 lines long, the outer broad prominently keeled segments about 2 lines diameter. Stamens about 20. Female flowers only seen very young. Fruit oblong or ellipsoid, 1 to 1½ in. long, the pericarp hard in the dried state. Testa more or less adhering to the endocarp, the endocarp marked outside with the ramifications of the raphe as in other species.—*Grisebachia Belmoreana*. Wendl. and Drude in Linnæa, xxxix. 202; *Howiea Belmoreana*, Beccari, Malesia, 66.

N. S. Wales. Lord Howe's Island, *C. Moore*, *Fullagar*.

F. Mueller distinguishes two species, the *K.Belmoreana* or "Curly Palm" with the segments of the leaves converging upwards and *K. Forsteriana* (F. Muell. Fragm. vii. 100; *Grisebachia Forsteriana*, Wendl. and Drude, l. c. 203; *Howiea Forsteriana*, Beccari, l. c.) or "Thatch or flat-leaved Palm," with the segments hanging. The specimens as far as they go show no difference that I can discover in the male flowers and fruits, and the distinctness of the two whether as varieties or species remains to be ascertained.

4. **K. Wendlandiana,** *F. Muell. Fragm.* vii. 102.—A tall palm. Leaves many feet long, the segments numerous, unequal, the longest 1½ ft. long, the upper ones confluent at the base, all or mostly jagged or toothed at the apex. Panicle of numerous slender pendulous spikes of about 1 ft., the common peduncle very short broad and thick, marked with the scars of the spatha and of 2 outer bracts, the primary branches very short and thick, the rhachis of the spikes slender, the notches very little immersed. Spatha and male flowers unknown. Female perianth under the fruit about 2 lines diameter, the segments all very broad, the inner twice as long as the outer ones. Fruit ovoid or globular, when dry about 4 lines diameter and longitudinally striate with prominent ribs, succulent when fresh with a thin endocarp. Seed erect, with an oblong oblique basal hilum, the testa free from the endocarp, the albumen not ruminate.—*Hydriastele Wendlandiana*, Wendl. and Drude in Linnæa, xxxix. 209.

N. Australia. Liverpool River, *Gulliver*.

Queensland. Cape York, *W. Hill*, *Daemel*; Cape Sidmouth, *Curdie*.

The Arnhem's Land and Queensland specimens appear to belong to one species, but it is possible that when better known they may prove to be distinct.

5. **K. Canterburyana,** *F. Muell. Fragm.* vii. 101; viii. 234.—A tall palm with a dense head of long pinnate leaves, the segments numerous, nearly equal and acuminate. Panicle branching into spreading spikes of about 6 in., the rhachis thick and flexuose, the notches not immersed and not close. Spatha unknown. Male perianth about 4 lines long, the outer segments narrow-lanceolate, about 2 lines, the inner ones broader and striate. Stamens 10 to 12, shorter than the perianth, although the filaments are as long as or longer than the anther. Central rudimentary ovary oblong. Female perianth: outer segments 3 lines broad and almost as long, inner ones ovate and rather shorter. Ovary 1-celled, with 1 erect ovule, but imperfect in the flowers examined. Fruit ellipsoid, 1½ in. long, the pericarp hard when dry. Seed erect as in the other species, but the linear hilum extending far up one side; testa thin more or less adhering to the endocarp, leaving the albumen reticulate with the complicated ramifications of the raphe.—*Hedyscepe Canterburyana*. Wendl. and Drude in Linnæa, xxxix. 204.

N. S. Wales. Lord Howe's Island, *C. Moore*; *Fitzgerald*. "Umbrella Palm."

6. **K.? acuminata,** *Wendl. and Drude in Linnæa*, xxxix. 207.—Only known from a single leaf and a loose fruit. Leaf about 3 ft. long but

the lower part wanting, the rhachis slightly scurfy-tomentose. Segments 22, the lower ones very narrow acuminate and entire, the intermediate ones gradually broader and 2-toothed, the terminal pair confluent at the base 1½ in. broad, truncate and many toothed at the apex each one readily splitting into 2. Fruit ovoid-globular, ¾ in. long.

W. Australia. Escape Cliffs, *Hulse.*

The materials are not sufficient to characterise a species, yet neither the leaf nor the fruit can be referred to the *K. Wendlandiana*, the only other pinnate-leaved Palm of which I have seen specimens from Arnhem's Land.

3. CLINOSTIGMA, Wendl.

(Cyphokentia, *A. Brongn.*)

Flowers monœcious in the same spadix, sessile along the branches, the males usually 2 together, the females solitary (later developed on the same notches?). Male flowers: outer perianth of 3 imbricate segments, inner longer of 3 valvate segments. Stamens 6 surrounding an abortive ovary. Female flowers: segments of both series imbricate. Ovary 1-celled? with 1 erect ovule. Fruit obliquely globular, the scar or remains of the style very excentrical or quite lateral. Seed erect, quite detached from the pericarp. Albumen not ruminate. Embryo basal.—Erect palms with the habit and pinnate leaves of *Kentia.*

Besides the Australian species, which is endemic, there are several from New Caledonia.

1. **C. Mooreanum,** *F. Muell. Fragm.* viii. 235.—A dwarf palm of 3 or 4 ft. Leaves said to be 3 or 4 ft. long, the segments numerous, about 1 ft. long, the young ones of our specimens longitudinally plicate. Inflorescence closely sessile; the spatha coriaceous, broadly ovate, about 6 in. long, with 2 outer concave bracts. Panicle very much branched, at first compact, spreading to about 1 ft. long and broad when in fruit. Male flowers very numerous, not yet open in our specimens, nearly globular, and about 1 line diameter, the outer segments half as long. Female perianth under the fruit expanded to 3 or 4 lines diameter. Fruit obliquely globular, about ½ in. diameter. Seed with an oblong oblique almost lateral hilum.—Wendl. and Drude in Linnæa, xxxix. 218; *Kentia Mooreana*, F. Muell. Fragm. vii. 101; viii. 234.

N. S. Wales. Lord Howe's Island, summits of Mount Gower and Mount Lingbird, *C. Moore.*

4. PTYCHOSPERMA, Labill.

(Seaforthia, *R. Br.*; Laccospadix and Archontophœnix, *Wendl. and Drude.*)

Flowers monœcious in the same spadix, sessile in the notches of a simple or branched rhachis, usually 2 males in each notch and a female one later developed in the same notch. Male flowers: outer perianth

of 8 imbricate broad segments; inner longer, of 3 valvate segments. Stamens 6 to about 20, inserted on a thick disk or receptacle without any rudimentary ovary; filaments shorter than or rarely as long as the anthers. Female flowers: perianth-segments of both series broad and imbricate, the inner not much longer than the outer. Staminodia none or small. Ovary 1-celled, with 1 ovule pendulous from the apex, the attachment slightly excentrical. Stigmas 3, at first erect and connivent, at length recurved. Drupe ovoid or globular, the pericarp succulent or when dry hard and fibrous. Seed with a terminal hilum, the thin testa more or less adnate to the endocarp, the albumen often but not always furrowed, deeply ruminate.—Tall palms, the caudex marked with annular scars. Leaves in a terminal crown, long and pinnately divided, the segments acuminate and entire or jagged or toothed at the end. Inflorescence under the leaves, long and simple or branched, at first enclosed in a rather thin spatha, with one or two sheaths or bracts below it.

Besides the Australian species, which are probably all endemic, there are a few in the Malayan Archipelago and (if truly congeners) in New Caledonia.

Wendland and Drude place *Ptychosperma* and *Archontophœnix* in a division with the ovules laterally attached their whole length, and Beccari in his character both of *Kentia* and of *Ptychosperma* describes the ovule as parietal. Both appear to have overlooked the important exceptional character of *Ptychosperma*, well pointed out by Blume, of the ovule pendulous from the apex, whilst in *Kentia* it is erect from the base, a character which I have verified in all the Australian species of the two genera of which I have had the female flowers.

Spadix long and simple . . . . 1. *P. laccospadix.*
Spadix branched.
  Leaf-segments acuminate. Male buds mostly oblique and rather acute.
  Leaf-segments whitish underneath . . . . 2. *P. Alexandræ.*
  Leaf-segments green on both sides . . . . 3. *P. Cunninghamii.*
  Leaf-segments jagged or truncate at the end. Male buds straight and obtuse . . . . 4. *P. elegans.*

1. **P. laccospadix,** *Benth.*—Stems "12 ft. high and 2 in. or more in diameter." Leaves several feet long, the segments numerous, acuminate or slightly notched at the end, the rachis slightly scurfy. Spikes simple "long and rope-like," above 2 ft. long in the specimen seen, the rhachis 3 or 4 lines diameter, the notches spirally approximate with very prominent borders, almost as in *Kentia Belmoreana.* Flowers unknown, except the old female perianths under the fruit, which are quite as in the congeners. Fruit red, ovoid, umbonate with the remains of the style, about 5 lines long, the pericarp not thick. Seeds closely adnate to the endocarp, with a terminal hilum. Albumen ruminate.—*Laccospadix australasicus,* Wendl. and Drude in Linnæa, xxxix. 206.

Queensland. Rockingham Bay, *Dallachy.*

2. **P. Alexandræ,** *F. Muell. Fragm.* v. 47 213, t. 43, 44.—A tall palm the stem attaining 70 to 80 ft. Leaves several feet long, the rhachis very broad and thick, glabrous or slightly scurfy, the segments

numerous, the longer ones 1½ ft. long ½ to 1 in. broad, acuminate and entire or slightly notched, green above, ashy-glaucous or white underneath. Spatha 1¼ ft. long. Panicle when open above 1 ft. long and broad; much branched, the rhachis more or less angular and flexuose, the notches scarcely immersed. Male perianth 2 to 3 lines long, the inner segments very frequently oblique, pale coloured, smoother and more acute than in *P. elegans*, the outer segments about 1 line long, slightly imbricate. Stamens usually 9 or 10, but varying in the flowers examined from 6 to 14, the filaments very short. Female perianth about 2 lines long, the segments all broad, and about equal in length. Fruit ovoid-globular, 7 to 9 lines long. Ovary and seed of the genus.—Fl. des Serres., t. 1916 (copied from F. Mueller); *Archontophœnix Alexandræ*, Wendl. and Drude in Linnæa, xxxix. 212.

Queensland. Rockingham Bay, *Dallachy.*

3. **P. Cunninghamii,** *Wendl. in Bot. Zeit.* 1858, 346.—A tall palm with the habit and inflorescence of *P. Alexandræ* and *P. elegans*, the segments of the leaves acuminate and entire or scarcely notched as in the former, but green on both sides. Flowers only known from the figure in the Botanical Magazine, where the perianth appears to be somewhat oblique and the inner segments rather acute though not so much so as in *P. Alexandræ.* Fruit unknown.—*Seaforthia elegans*, Hook. Bot. Mag. t. 4961, not of R. Br.; *Archontophœnix Cunninghamii*, Wendl. and Drude in Linnæa, xxxix. 214.

Queensland. Sunday Island (E. coast, near Cape York), *A. Cunningham*; Rockhampton, *Nernst.*
N. S. Wales. Illawarra, *A. Cunningham*; Woollongong, *Ramsay.*

This species, if really distinct from *P. elegans*, is as yet very imperfectly known. No flowers have been preserved. Cunningham's specimens were gathered at the same time and place as a leaf of the true *P. elegans*, and no garden specimens have flowered since the one figured. The fruits and analysis in the plate quoted are copied from Martius' plate of *R. elegans.*

Archontophœnix Veitchii, Wendl. and Drude in Linnæa, xxxix. 213, known only in leaf, does not appear to me to differ from *P. Cunninghamii*, judging at least from O'Shanesy's Rockhampton specimen.

4. **P. elegans,** *Blume, Rumphia*, ii. 118.—Variously described as a low or very tall palm. Leaves attaining several feet, the segments numerous, more or less toothed or irregularly jagged at the end. Panicles lateral, 1 to 1½ ft. long and broad, branching into numerous spikes, the main rhachis flattened or angular, the ends of the spikes very flexuose, the notches scarcely excavated. Male perianth about 2 lines long, the bud straight and obtuse, the outer segments about half as long. Stamens from under 10 to above 20, the filaments shorter than or perhaps ultimately as long as the anthers. Female perianth spreading under the fruit to a diameter of above 3 lines, the inner segments not much longer than the outer. Fruit ovoid-globose, nearly ½ in. diameter. Albumen deeply and irregularly ruminate.—*Seaforthia*

elegans, R. Br. Prod. 267; Mart. Hist. Nat. Palm. iii. 181, t. 105, 106, 107.

Queensland. Endeavour River, *Banks and Solander;* Cape York, *W. Hill*, *Daemel;* Sunday Island, *A. Cunningham;* Cumberland Islands, *Nernst*; Rockhampton and neighbourhood, *Thozet*, *Nernst*.

P. capitis-yorkii, Wendl. and Drude in Linnæa, xxxix. 217, is described from a leaf and spadix without flowers from Cape York, *Veitch*, which I have not seen, but I can find nothing in the character given to distinguish it from several of Daemel's Cape York specimens of *P. elegans*.

5. ARECA, Linn.

Flowers monœcious in the same spadix, the upper ones or all of some branches males and singly sessile or 2 together, the females singly sessile along the main rhachis or at the base of the branches. Male flowers: outer perianth-segments 3, scarcely imbricate, inner 3, longer and valvate. Stamens 3 to 15, filaments short; ovary rudimentary. Female flowers: perianth-segments of both series imbricate. Staminodia small. Ovary 1-celled, with 1 erect ovule. Stigmas 3, at first erect, at length spreading. Drupe ovoid, the exocarp succulent and fibrous, the endocarp crustaceous. Seed erect; albumen deeply ruminate; embryo basal.—Tall palms with a crown of long pinnate leaves. Spadix branching, inserted below or amongst the leaves, the spatha single, membranous or fibrous-coriaceous.

The genus extends over East India and the Malayan Archipelago and perhaps to Madagascar. The only Australian species is as yet very doubtful as to its character and affinities.

1. **A. Normanbyi**, *F. Muell. Fragm.* viii. 235.—Said to be a palm of 40 to 60 ft. with leaves 8 to 10 ft. long, and an axillary inflorescence, but described from a single fruit, ovoid with a conical tip, about 1¼ in. long, the pericarp almost woody, resting on an old perianth of which the outer series is nearly 3 lines, the inner series ½ in. diameter. Seed large, erect, adhering on one side halfway up the endocarp, the albumen deeply ruminate.—*Cocos Normanbyi*, W. Hill, Rep. Brisb. Bot. Gard. 1874–6 (*F. Mueller*.)

Queensland. Daintree River, *W. Hill*.

6. COCOS, Linn.

Flowers monœcious in the same spadix, the upper ones male and densely crowded, the lower females few. Male perianth: outer segments 3, imbricate, inner 3 much longer, valvate. Stamens 6, with thick filaments; anthers erect but attached above the base. Ovary rudimentary. Female perianth: segments all nearly equal, broad, imbricate. Ovary 3-celled, with 1 erect ovule in each cell but 2 usually abortive. Stigmas 3, at first erect, at length spreading. Drupe large, ovoid or oblong, with a thick fleshy and fibrous exocarp; endocarp bony, marked at the base with 3 pits.

Seed solitary, enveloped in pulp; hilum lateral; albumen not ruminate. Embryo basal.—Tall palms, the stem marked with annular scars and long retaining the scale-like base of the petioles. Leaves in a terminal crown, simply pinnate with numerous longitudinally plicate segments. Inflorescence from the base of the leaves, the spadix with numerous long simple branches. Spatha long and woody, with an open outer bract.

The genus comprises several South American species besides the Australian one, which is common in tropical Asia, chiefly near the seacoast, and is spread by cultivation over the tropical regions of the new as well as the old world.

1. **C. nucifera,** *Linn.; Kunth, Enum.* iii. 285.—This, the well-known "Cocoa-nut Palm" attaining often 70 to 80 ft., is said to be of stunted and crooked growth in the open sandy flats of Keppel Bay and about 30 ft. high, the leaves 12 to 16 ft. long with numerous rigid segments. Spatha fusiform, thick and woody, 5 to 6 ft. long, the spikes 1 to 2 ft., the common peduncle 1 ft. Male perianth about 4 lines long, the outer segments scarcely 1 line. Filaments nearly as long as the anthers. Female perianth, with a slightly enlarged ovary in the specimen, very broad and coriaceous, the outer segments about 1 in. diameter, the inner rather larger. Fruit ovoid, obtusely 3-angled, about 6 in. diameter.—Mart. Hist. Nat. Palm. ii. 123, t. 88; Gærtn. Fruct. t. 4, 5; Roxb. Corom. Pl. t. 73.

Queensland. Rockhampton and Keppel Bay, *Thozet.*

7. ARENGA, Labill.

(Saguerus, *Blume.*)

Flowers monœcious, but usually in separate spadices, the males 2 together along the branches, the females singly sessile, the rhachis not excavated. Outer perianth in both sexes of 3 imbricate segments, inner longer of 3 valvate segments. Stamens in the males numerous, without any rudimentary ovary. Ovary in the females 3-celled, with 1 ascending ovule in each cell. Berry fleshy. Seeds 3 or fewer by abortion, each one enveloped in a pellucid pulp; testa thick and hard; albumen horny, not ruminate. Embryo dorsal.—Tall palms, the stem irregularly marked with annular scars, retaining in the upper part the thick basis of the petioles and a network of thick filaments. Leaves in a terminal crown, pinnate with numerous segments toothed or jagged at the end. Spadix with long simple branches, the peduncle enveloped in several imbricate sheathing bracts. Flowers rather large.

The genus consists of very few species, from East India and the Malayan Archipelago. The only Australian one is believed by Beccari to be the common cultivated *A. saccharifera*, Labill. (Beccari, Malesia, 78, *Saguerus saccharifer*, Blume, Rumphia, ii. 128, t. 123, 124), introduced by the Malays, but it is described as *Saguerus australasicus*, Wendl. and Drude in Linnæa, xxxix. 219, from a single large leaf, with 140 or more long narrow rigid segments slightly toothed at the end, from Goold or Garden Islands, *Dallachy.* It is said to be there a beautiful Palm of about 20 ft.

8. CARYOTA, Linn.

Flowers monœcious in the same spadix, sessile in the notches of the long pendulous branches of the inflorescence, usually 2 males in each notch and a female one later developed in the same notch. Outer perianth in both sexes of 3 imbricate ovate segments, inner longer of 3 valvate segments. Stamens in the males numerous, inserted on a thick disk without any rudimentary ovary; filaments very short; anthers linear. Staminodia in the females very small, usually 3. Ovary usually 2 or 3-celled, but only 1 or rarely 2 with a perfect erect ovule in each. Stigmas terminal, at first erect in a cone, at length spreading. Berry or succulent drupe globular, with a thin endocarp. Seeds solitary and globular or 2 and hemispherical, the testa free from the endocarp. Albumen horny, ruminate. Embryo dorsal.—Tall palms, the caudex marked with annular scars. Leaves in a loose terminal crown, very large, twice pinnate, the segments rhomboidal or cuneate, often very oblique and irregularly toothed or jagged.

The genus consists of few species spread over tropical Asia, the only Australian one extending over the Malayan Archipelago to the eastern provinces of East India.

1. **C. Rumphiana**, *Mart. Hist. Nat. Palm.* iii. 195.—Leaves and inflorescence in our specimens perfectly glabrous, the leaf-segments very oblique, half fan-shaped, much plicate, 6 to 8 in. long and 2 to 3 in. broad, rigid, irregularly and obtusely toothed, the lower margin sometimes produced into a long obtuse point, sometimes shorter than the next fold. Spikes often above 2 ft. long. Male flowers about 5 lines or rather more. Stamens above 30. Ovary in the flowers examined with 1 perfect ovule. Fruit globular, $\frac{1}{2}$ to $\frac{3}{4}$ in. diameter.—Beccari, Malesia, 70; *C. obtusa*, Griff. in Calc. Journ. v. 480, Palm. Ind. 170, t. 236; *C. Alberti*, F. Muell.; Wendl. and Drude in Linnæa, xxxix. 221.

Queensland. Cape York, *Daemel*, the fruits from *A. Richardson.*

Also in the Malayan Archipelago and the eastern provinces of India. The foliage is exactly that of our specimens of *C. obtusa*, Griff., correctly referred by Beccari to *C. Rumphiana*, Mart. and differs from that of the common *C. urens* chiefly in the very obtuse dentation. Wendl. and Drude observe that the Australian species is remarkable (as compared with *C. urens*) for the great size of the spadix and flowers, but the male flowers in our specimens are exactly the size of those of the true *C. urens*, when fully out, and in that species the spadix according to Griffith attains 10 to 12 ft.

9. LICUALA, Rumph.

Flowers hermaphrodite, in a loose panicle, with sheathing bracts on the main rhachis and peduncle. Outer perianth 3-lobed or 3-toothed, inner of 3 valvate segments. Stamens 6, the filaments united in a cup or ring and very shortly free; anthers sagitate. Ovary laterally 3-lobed, the carpels readily separating, with 1 erect ovule in each; style columnar, with 3 small stigmas. Fruit globular, reduced by abortion to 1 carpel, the pericarp fleshy but at length hard, scarcely fibrous. Seed erect, the hilum somewhat lateral. Albumen horny with a deep irregularly branched excavation on the inner side, filled with a brown spongy tissue. Embryo dorsal.—Palms usually slender or low. Leaves large, fan-shaped but usually closed all round so as to appear peltate, the plicate lobes more or less truncate and toothed at the end. Panicles from among the leaves, often long, the partial panicles between the sheathing bracts usually divided into few spreading spikes. Flowers small.

The genus is widely spread over tropical Asia, the only Australian species too little known to determine how far it may be endemic or distinct.

1. **L. Muelleri,** *Wendl. and Drude in Linnæa,* xxxix. 223.—Young trees described as 30 ft. high. Leaves closed all round so as to appear peltate, plicate, and divided to more than half the length into truncate lobes obtusely toothed and jagged and 2 to 3 in. broad at the end, the whole leaf forming a flat stiff shield-like disk 6½ ft. across. Flowers unknown. Fruits "crimson in large straggling panicles," ovoid-globular, 4 to 5 lines diameter. Albumen penetrated by a deep irregularly branched excavation. Embryo dorsal.—*Livistona Ramsayi,* F. Muell. Fragm. viii. 221.

Queensland. Dalrymple Gap, Rockingham Bay, *Dallachy.* Although the flowers are unknown it is probable that Wendland and Drude are correct in transferring this palm from *Livistona* to *Licuala,* but its precise affinities must remain for the present undetermined.

10. LIVISTONA, R. Br.

Flowers hermaphrodite, in a loose panicle, with sheathing bracts on the main rhachis and peduncle. Outer perianth thin, 3-lobed or 3-toothed, inner longer, of 3 valvate segments. Stamens 6, distinct but contiguous; filaments broad and thick very shortly filiform at the top; anthers small, ovate. Ovary laterally 3-lobed, the carpels readily separating, with 1 erect ovule in each. Style shortly columnar, with a 3-toothed stigma. Fruit ovoid or globular, reduced by abortion to a single carpel, the pericarp not thick, hard when dry. Seed erect, the hilum somewhat lateral. Albumen with a deep broad excavation on the inner side, filled with a brown spongy tissue. Embryo dorsal.—Low or tall erect palms. Leaves fan-shaped, plicate, the lobes or segments acuminate and entire or 2-cleft, and frequently a small bristle or filament between the lobes. Panicles usually large and decompound from among the leaves. Flowers very small, solitary or clustered along the slender rhachis of the ultimate branches.

Besides the Australian species which are endemic, there are a very few from the Malayan Archipelago or South China.

Fruit obovoid-oblong. Perianth scarcely 1 line long.
  Petiole more or less aculeate on the edges. Outer perianth-lobes rather obtuse . . . . 1. *L. humilis.*
  Petiole entirely unarmed. Outer perianth-lobes acute . . 2. *L. inermis.*
Fruit globular. Perianth 1½ lines long. Outer perianth-lobes acute . . . . 3. *L. australis.*

1. **L. humilis,** *R. Br. Prod.* 268.—Stems 4 to 6 ft. high (*Martius*) 10 ft. (*Schultz*) 15 ft. or tall (*Gulliver*). Leaves orbicular-cordate in circumference when fully out, with a radius of about 1½ ft., deeply divided into narrow plicate segments tapering to a fine point, the thread-like bristles between the lobes varying from nearly 1 in. to very minute or altogether wanting; petiole much flattened, the acute edges more or less bordered by small prickles in our specimens, but said to be often intermixed with larger ones even as much as ½ in. long. General panicle very large and loose, the partial ones between the sheathing bracts pyramidal and 8 in. to 1 ft. long, twice or three times branched, the ultimate branches or slender spikes ½ to 1 in. long in flower, often twice that in fruit. Flowers numerous, in little sessile clusters along the spikes. Inner perianth-segments scarcely 1 line long, the outer perianth about ½ as long with short broad rather obtuse lobes. Berry ovoid-oblong, obtuse, 7 to 8 lines long, more or less contracted at the base. Seed oblong, somewhat flattened.—Mart. Hist. Nat. Palm. iii. 239, t. 109, 110, 111; Wendl. and Drude in Linnæa, xxxix. 231; *L. Leichhardtii*, F. Muell. Fragm. viii. 221.

N. Australia. Arnhem's Land, *R. Brown* (no specimens seen); Albert River, M'Adam Range, *F. Mueller*; Port Darwin, *Schultz*, n. 372; Port Essington, *Armstrong;* Liverpool River, and Wood Island, *Gulliver.*

F. Mueller refers to this species a palm found by Giles in the so-called Glen of Palms, Macdonnel Range, in the interior, but the only leaf I have seen looks rather like that of *L. australis.* It cannot however be determined without flower or fruit.

2. **L. inermis,** *R. Br. Prod.* 268.—A moderate sized or tall palm (14 to 30 ft.), with the ovoid-oblong fruits of *L. humilis*, but said to differ in the petioles entirely without prickles and the lobes of the outer perianth more acute.—Mart. Hist. Nat. Palm. iii. 239, t. 145, 146.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown.* I have seen no specimen of this palm and Martius appears only to have known it from Bauer's drawings which he copied, the general habit being also represented in Flinder's Voyage in the view of Sir E. Bellew's Island, vol. ii. p. 172. It may prove to be a variety only of *L. humilis.*

3. **L. australis,** *Mart. Hist. Nat. Palm.* iii. 241.—Stems attaining 40 to 80 ft. Leaves in a dense crown, orbicular in circumscription when fully out, 3 to 4 ft. diameter, divided to the middle or lower down into narrow plicate acuminate lobes either entire or 2-cleft at the apex. Panicle large, very much branched, quite glabrous, the primary branches thick, often angular, and usually much curved and flexuose,

the ultimate branches or spikes 1 to 3 in. long. Spatha at the base of the panicle sheathing with a lanceolate point, 6 to 10 in. long. Flowers not so closely sessile as in *L. humilis* and not so small. Inner perianth about 1¼ lines long, the outer fully ⅓ as long with very acute lobes, Fruit globular, 6 to 9 lines diameter, the pericarp hard and crustaceous when dry. Seed globular.—Wendl. and Drude in Linnæa, xxxix. 232; Bot. Mag. t. 6274; *Corypha australis*, R. Br. Prod. 267; *L. inermis*, Wendl. and Drude, l. c. 229.

Queensland. Woods, *W. Hill;* Rockhampton (Moore's Creek Range), *Thozet.*
N. S. Wales. Illawarra, *Ralston.*
Victoria. Snowy Range, *F. Mueller.* I refer this here on the authority of F. Mueller, Fragm. v. 49. There is only a single small leaf preserved in his herbarium which looks somewhat different.

The specimen figured in the Botanical Magazine was raised at Kew from seeds collected by Cunningham probably at Illawarra. Wendland and Drude can surely not have had access to Martius' work for they refer to a plate of *L. australis* which I cannot find there, besides the mistake they have fallen into as to the *L. inermis.*

ORDER CXXXIV. PANDANEÆ. (Typical Tribe.)

Flowers diœcious, closely packed in dense spikes or heads, of which several in a terminal spike or raceme or rarely solitary with a leafy or coloured bract under each. Perianth none. Males consisting of numerous stamens covering the rhachis, the filaments all distinct or more or less collected or united in clusters. Anthers oblong or linear, 2-celled, the cells opening in longitudinal slits. Females: ovaries numerous, sessile, covering the rhachis and often cohering or connate in clusters or syncarps or all together at least at the base, each ovary 1-celled, with 1 ovule erect from the base, or with numerous ovules superposed in 2 rows on 2 or 3 parietal placentæ. Stigma sessile on the apex of the ovary or of a thick conical style. Fruits drupaceous, densely crowded or more or less connate in globular ovoid or cylindrical heads. Seeds solitary or numerous, with a small embryo at the lower end of a fleshy or horny albumen.—Trees bushes or tall climbers. Leaves undivided, in spires at the top of the stem, or disposed along the branches.

The above character applies only to the typical tribe limited to the Old World and ranging over the tropical regions of Asia, Africa, and islands of the Mascarene group, Malayan Archipelago and South Pacific, the two Australian genera having the most extensive range within that area. To these must be added one or two genera which appear to be really distinct chiefly from New Caledonia, most of those added by Gaudichaud being again reduced to *Pandanus*. Besides these the Order is usually made to include the American tribe *Cyclantheæ* which have often divided leaves, monœcious flowers, and small or rudimentary perianths.

The clusters into which the drupes in some species are united have been sometimes described as many-celled drupes. It seems however more conformable to received terminology to restrict the term drupes to the single pyrenes resulting from the single ovaries, and if necessary to use the term syncarp for the clusters of drupes when perfectly connate.

Stems arborescent or shrubby, the branches terminating in
a triple spire of long leaves. Ovules solitary . . . 1. PANDANUS.
Stems climbing, the branches leafy. Ovules numerous
superposed in 2 rows on 2 or 3 parietal placentas . . 2. FREYCINETIA.

1. PANDANUS, Linn.

Male flowers in dense spikes, sessile or pedunculate in the axils of leafy or coloured bracts, forming a terminal compound spike. Stamens either separate or more or less united in clusters. Female flowers: Ovaries densely packed in a globular or oblong head or spike, with 1 ascending ovule in each. Drupes crowded or connate in a globular or cone-like head, often separable into clusters.—Stem woody, usually arborescent and branching. Leaves, long, coriaceous, spreading, prickly on the edges and often on the midrib, generally closely inserted towards the ends of the branches in 3 spiral series.

The genus is widely spread over the tropical regions of the Old World, chiefly near the sea. Of the four or five Australian species one is common in a great part of the range of the genus, the others appear to be all endemic.

SECT. I. **Keura.** *Filaments connate in clusters. Stigmas peltate or reniform, sessile on the flat convex or broadly conical apex of the ovaries. Drupes connate in clusters or rarely separate.*

Filaments united in a column longer than the free part.
Drupes connate in clusters, nearly flat on the apex.
Male spikes sessile . . . . 1. *P. odoratissimus.*
Drupes all free. Other characters of *P. odoratissimus* . 2. *P. aquaticus.*
Drupes connate in clusters, each with a conical apex.
Male spikes pedunculate . . . . 3. *P. pedunculatus.*
Filaments very shortly united at the base. Drupes connate in clusters, each with a very convex apex . . 4. *P. Forsteri.*

SECT. II. **Acrostigma.** *Filaments free. Stigmas raised on the acute or acuminate apex of the ovary or style. Drupes free or equally connate at the base.*

Single Australian species . . . . 5. *P. monticola.*

SECTION I. KEURA, *Kurz.*—Filaments connate in clusters. Stigmas peltate or reniform, sessile on the flat convex or broadly conical apex of the ovaries. Drupes connate in clusters or rarely separate, the clusters collected in a large head.

1. **P. odoratissimus,** *Linn. f. Suppl.* 424.—Stems "from a creeping base arborescent, branched, 15 to 20 ft. high." Leaves 3 to 5 ft. long or on young luxuriant individuals twice as long, 2 to 3 in. broad, acuminate, bordered by small prickles turned upwards. Male inflorescence terminal, recurved, often above 1 ft. long, consisting of about 6 to 20 dense spikes of 1½ to 3 in., each one sessile in the axil of a leafy bract, the lowest of which are often 1 ft. long and nearly resemble the smaller upper leaves, tapering into a long narrow point, the upper ones gradually smaller with shorter points and whiter, but all much longer than the spikes, the margins serrulate, scabrous but scarcely prickly. Stamens exceedingly numerous, densely covering the rhachis, but the filaments united 10 to 20 together in a column often ¼ in. long, shortly free only at the ends, with linear anthers of 1½ to 2 lines. Drupes

cuneate, hard and woody, 2 to 3 in. long, very obtuse, connate in clusters of 8 to 20 and these collected in a globular head 6 to 8 in. diameter, the clusters flat and areolate at the top, the apex of each drupe scarcely prominent, and the remains of the stigmas quite flat, the pericarp when old splitting into fibres at the base.—Roxb. Corom. Pl. t. 94 to 96; *P. spiralis,* R. Br. Prod. 341, and the numerous synonyms quoted by S. Kurz in Seem. Journ. Bot 1867, 125, and in Journ. Asiat. Soc. Bengal, xxxviii. 149, under *P. verus*, a Rumphian designation used previous to the establishment of the Linnæan nomenclature.

N. Australia. *R. Brown* (no label in his herbarium); Arnhem's Land and Islands of the Gulf of Carpentaria, *F. Mueller ;* Port Darwin, *Schultz, n.* 613 ; Escape Cliffs, *Hulse ;* King's Sound, *Hughan.*

The species is widely spread over tropical Asia and the Malayan Archipelago. The single drupes in F. Mueller's specimens as well as the clusters of drupes are much larger than in the usual Indian specimens as observed by Dr. J. B. Balfour, but they show no character to distinguish them specifically.

2. **P. aquaticus,** *F. Muell. Fragm.* v. 40 and viii. 220.—Differs from *P. odoratissimus*, according to F. Mueller's notes, in the stem emitting no adventitious descending roots, and in the drupes in the head not cohering in clusters. Our specimen consists of leaves only and a male inflorescence, in no respects distinguishable from those of *P. odoratissimus*, and the want of adventitious roots may occur in many species.

N. Australia. Upper Victoria River, *F. Mueller.*

3. **P. pedunculatus,** *R. Br. Prod.* 341.—Stems "emitting stolons at the base, arborescent" (*R. Brown*). Leaves broader than in *P. odoratissimus,* tapering into a long narrow point, the edges prickly. Of the male inflorescence I have only seen loose spikes of 3 or 4 in. on peduncles nearly twice as long, otherwise resembling those of *P. odoratissimus,* the filaments similarly united in columns of about ½ in., the free part shorter than the anthers. Rhachis of the female spike or head very thick, obtusely triangular, 2 to 4½ in. long, on a thick peduncle of 5 in. with the remains of a few leaves or bracts under the head all split into shreds. Drupes in narrow clusters of 7 to 18, about 2 in. long, very hard and smooth outside, apparently not splitting into fibres, the conical apexes of the drupes very prominent at the top, each with the remains of a reniform stigma.

Queensland Port Denison, *Henne ;* Rockhampton, *Dallachy* (leaves only, 1 to 1½ in. broad, referred here by F. Mueller).

N. S. Wales. Durval, *Leichhardt* (leaves only, 4 in. broad, referred here by F. Mueller) ; Richmond River, *Henderson ;* Hastings River, *Beckler.*

I found no specimen in Brown's Herbarium, it is given as tropical in the Prodromus.

4. **P. Forsteri,** *Moore and Muell. ; F. Muell. Fragm.* viii. 220.—Closely resembles *P. odoratissimus* in habit as far as can be judged from

Fitzgerald's sketch in F. Muell. Fragm. vii., as well as in foliage and male inflorescence in as far as shown by the specimens. Stamens more numerous in each cluster in the dense spike, and the filaments only shortly united at the base, some of the outer ones of each cluster free, and all much longer than the anthers which vary from 1 to 1½ lines long. Drupes about 2 in. long, united in clusters of 4 to 7 and fibrous at the base when old as in *P. odoratissimus*, but the convex apex of each drupe more prominent, and the stigma slightly raised above the summit. The whole fruit or head said to be nearly 1 ft. long. Seed as in *P. odoratissimus* laterally attached near the base, the testa thin and brittle. Embryo small, oblong, at the base of the albumen.

N. S. Wales. Lord Howe's Island, *C. Moore*, *Fullagar*.

SECTION II. ACROSTIGMA, Kurz (genus *Fisquetia*, Gaudich.)—Filaments free. Stigmas raised on a conical or oblong acute or acuminate style or apex of the ovary. Drupes free or equally connate at the base.

5. **P. monticola,** *F. Muell. Fragm.* v. 40, vii. 63, *and* viii. 220.—Stem weak, half climbing, attaining 2 in. diameter. Leaves placed as in other species but very long, hanging, bordered by small prickles or serratures. Male inflorescence narrow, the spikes sessile along the rhachis, rather distant, 2 to 3 in. long. Bracts at their base membranous but imperfect in the specimens seen. Stamens crowded, irregularly collected in clusters, but the filaments free or scarcely united at the base. Anthers narrow, fully 3 lines long, finely mucronate. Fruit (only one seen) nearly globular, 2½ in. diameter including the styles. Receptacle ovoid, hollow. Drupes exceedingly numerous, closely packed and slightly cohering, about 5 lines long, the pericarp thick and produced into thick linear-conical or oblong shortly acuminate styles above ¼ in. long, with small terminal stigmas. Seeds normal.

Queensland. Rockingham Bay, *Dallachy*.

2. FREYCINETIA, Gaudich.

Flowers diœcious in dense spikes, pedunculate or sessile in the axils of deciduous leafy or small bracts and usually 2 or 3 spikes together at the ends of the branches. Male flowers. Stamens crowded on the rhachis, the filaments all free; anthers small, ovate, adnate, with revolute valves, resembling little globular heads. Female flowers: Ovaries often surrounded by 2 or 3 short staminodia, densely packed on the rhachis, cohering by their membranous almost gelatinous bases, imperfectly divided by 2 or 3 projecting parietal placentæ; stigmas or stigmatic lobes 2 or 3, sessile. Ovules numerous, superposed in 2 series on each placenta. Fruits small and numerous, in ovoid oblong or cylindrical heads, succulent at the top, connate at the base and bursting irregularly. Seeds numerous, oblong, bearing on one or both sides a longitudinal loosely cellular appendage or strophiole.—Straggling or climbing perennials or shrubs with leafy branches. Leaves with numerous parallel veins, their sheathing bases closely embracing the branches and often torn up into shreds or filaments, the floral leaves usually smaller and coloured.

The genus comprises but few species, spread over the islands of the Malayan Archipelago and the Pacific and New Zealand. The common Australian species is also in the Malayan Archipelago, whether the second be the same as any of the extra-Australian ones or not we have at present no means of determining.

Leaves about 6 in. long, shortly acuminate	1. *F. Gaudichaudii.*
Leaves 8 in. to 1 ft. long, tapering into a long subulate point	2. *F. excelsa.*

1. **F. Gaudichaudii,** *Br. and Benn. Pl. Jav. Rar.* 31, t. 9.—Stems straggling or climbing and rooting, more or less covered with the short sheathing bases of the leaves, the membranous margins of the sheaths often torn up into shreds or filaments. Leaves mostly about 6 in. long and ½ to 1 in. wide, shortly acuminate, with numerous parallel veins, the midrib more prominent, often minutely aculeate as well as the edges. Spikes in our Australian specimens female, ovoid-oblong or sometimes short and almost globular, the longer ones 1 to 1½ in. long when in fruit, on peduncles of ½ to 1 in., about 3 together at the ends of the branches. Ovaries very numerous, closely pressed and cohering by their membranous bases, free in the upper half, with a small terminal area divided more or less distinctly into 2 or 3 stigmas. Fruits bursting irregularly. Seeds numerous, oblong, about ½ line long, the rich brown smooth testa contrasting with the white oblong cellular longitudinal appendages or strophioles, the inner one as large as the rest of the seed the outer one much narrower.

Queensland. East coast within the tropics, *A. Cunningham;* Cape York Peninsula, *Hann's Expedition;* Rockingham Bay, *Dallachy;* Rockhampton, *O'Shanesy, Thozet;* Port Mackay, *Nernst.*

Also in the Malayan Archipelago.

2. **F. excelsa,** *F. Muell. Fragm.* v. 39.—Leaves 8 in. to 1 ft. long, mostly 3–4 lines broad but dilated at the base into short broad imbricate sheaths, tapering into long subulate points, the edges serrulate-spinulose towards the base as well as the margins of the sheaths. Spikes only seen young and slender, above 1 in. long, and too imperfect for examination.

Queensland. Rockingham Bay, *Dallachy;* Glasshouse Mountains, Moreton Bay, *W. Hill;* Maroochie, *Herb. F. Mueller.*

This is evidently distinct from any species I am acquainted with, but unfortunately the only specimen in fructification is not in a state to admit of examining the structure of the spike.

ORDER CXXXV. AROIDEÆ.

Flowers unisexual or sometimes hermaphrodite, closely packed in a dense simple spike or *spadix*, with a convolute or rarely flat coloured or leaflike bract or *spatha* at its base. Stamens and ovaries either in different parts of the spadix without perianth or bracts, or stamens 6 or fewer round each ovary, with or without a small scale-like perianth-segment under each stamen; anthers usually 2-celled, sessile or on a thick filament, the cells opening in terminal pores or outwards in longitudinal slits. Ovaries sessile, 1- to 3-celled, with 1 or more ovules in each cell variously attached; stigma sessile or on a short simple style. Fruit a berry. Seeds 1 or few, surrounded by pulp, with an appressed testa; albumen usually copious with an axile embryo, or in a few genera albumen none with a thick embryo and prominent plumula in a terminal groove as in *Naiadeæ*.—Herbs with a perennial tuberous or creeping rhizome and radical leaves and scapes, or with long creeping or climbing or rarely erect stems. Leaves entire or variously divided, sometimes very large, the veins usually pinnate or reticulate, or rarely grass-like leaves with parallel veins.

The order is chiefly tropical, in both the New and the Old World, but is also represented in more temperate regions, especially in the northern hemisphere. Of the six Australian genera five are Asiatic, three of them extending also into Africa, one only is endemic.

Aroideæ have been most carefully worked up in several splendid works by the late H. G. Schott of Vienna, but with an inordinate multiplication both of genera and of species. The genera here included are perfectly distinct from each other, but it is very uncertain how many of Schott's Asiatic and African and even American genera should be included in some of them.

No perianth.—Fowers unisexual, the females at the base of the spadix, the males below a terminal appendage. Leaves and scapes radical. Seeds albuminous.

A number of neutral filiform organs immediately above the female flowers and a bare interval separating them from the males. Ovary with 1 erect ovule. Leaves entire or 3-lobed . . . . 1. **Typhonium.**

Male flowers immediately above the females. Ovary 2-celled, with 1 erect ovule in each cell. Leaves compound . . . . 2. **Brachyspatha.**

Male flowers separate from the females by ovoid neutral organs without any bare interval. Ovary 1-celled, with several often numerous ovules. Leaves large, cordate or peltate . . . . 3. **Colocasia.**

No perianth. Flowers hermaphrodite or the lower ones without stamens, occupying the whole spadix. Ovary with a small cell and several ovules under a thick mass filled with rhaphides. Stems creeping or climbing. Leaves entire or pinnatifid . . . . 4. **Rhaphidophora.**

Perianth of 4 or 6 scales in 2 rows; with a stamen opposite each scale. Flowers hermaphrodite, occupying the whole spadix.

Flowers 4-merous. Ovary 1-celled with 1 pendulous ovule. Seed albuminous. Leaves radical grass-like . . . . 5. **Gymnostachys.**

Flowers 6-merous. Ovary 3-celled with 1 erect ovule in each cell. Embryo large without albumen. Stem climbing. Leaves distichous, the laminæ articulate on a phyllodineous petiole . . . . 6. **Pothos.**

1. TYPHONIUM, Schott.

Spatha contracted above the convolute base, the lamina broad, spreading or recurved. Flowers unisexual, the females at the base of the spadix, with subulate neutral organs immediately above them, the males separated by a bare interval, the spadix terminating in a long thick fleshy appendage. Perianth none. Anthers 2-celled, sessile in pairs (appearing like 4 1-celled anthers), the cells opening in terminal pores (or in species not Australian in slits continued to the base). Ovary sessile or nearly so, 1-celled, with a single erect ovule; stigma peltate, sessile or shortly stipitate. Berry 1-seeded. Albumen copious.—Herbs with a hard tuberous rhizome. Leaves entire or 3-lobed, radical as well as the scape.

The genus is generally spread over the warmer regions of the Old World. It differs from the European group now considered as the typical *Arum*, chiefly in the solitary ovules. The Australian species are, as far as known, endemic.

Leaves entire.
  Leaves linear, 1 ft. long or more . . . . 1. *T. liliifolium.*
  Leaves ovate or lanceolale, 3 or 4 in. long . . . . . 2. *T. alismifolium.*
Leaves 3-lobed.
  Lobes lanceolate or ovate-acuminate . . . . 3. *T. Brownii.*
  Lobes linear . . . . 4. *T. angustilobum.*

1. **T. liliifolium,** *F. Muell.; Schott, Prod. Syst. Aroid.* 107.—Leaves linear throughout, 1 to $1\frac{1}{2}$ ft. long, including the petiole, which is sheathing at the base and gradually passes into a lamina, scarcely broader and tapering to a point. Scape about 6 in. high. Spatha with a nearly globular convolute base, the lamina ovate-lanceolate, nearly 6 in. long, tapering to a point. Female spike at the base of the spadix ovoid, about $\frac{1}{2}$ in. long. Neutral organs filiform, recurved, rather numerous. Male spike after a bare interval of about 1 in. cylindrical, about $\frac{1}{2}$ in. long. Appendage considerably thicker, obliquely truncate at the base, narrow conical, acuminate, about $\frac{1}{2}$ in. long. Berry ovoid-globular.—F. Muell. Fragm. viii. 187.

N. Australia. Victoria River, *F. Mueller.* The reference given by Schott and copied by F. Mueller to Hook. Kew. Miscell. 1856, 321, is not quite correct. This plant was only named in manuscript labels by F. Mueller, but is mentioned without a specific name in Hook. Kew. Journ. viii. 329, in a paper of F. Mueller's commencing at p. 321.

2. **T. alismifolium,** *F. Muell. Fragm.* viii. 186—A smaller plant than the other Australian species, the tuber apparently smaller and not so hard. Leaves undivided, ovate-lanceolate or lanceolate, acuminate, rounded or scarcely cordate at the base, 3 to 4 in. long. Spatha dark purple or almost black inside, 4 to 5 in. long, tapering to a long point and not $1\frac{1}{2}$ in. broad in the broadest part. Flowers in the same relative position as in the other Australian species, the terminal appendage rather long. Berry ovoid-globular, about 2 lines diameter.

Queensland. Rockingham Bay, *Dallachy.*

3. **T. Brownii,** *Schott, Aroid.* 11, t. 15.—Leaf-petiole 6 in. to 1 ft. long, the lamina divided nearly or sometimes quite to the base into 3 narrow or broad lanceolate lobes or segments, the lateral ones horizontally divaricate, 4 to 6 in. long, either nearly equal on both sides or more or less dilated at the base on the lower side, the middle lobe usually rather longer and narrower. Scape shorter than the petiole. Spatha with the convolute base ovoid, the lamina 4 to 5 in. long, very broad, of a deep purple inside. Female spike at the base of the spadix ovoid, about ½ in. long. Neutral organs filiform, recurved. Male spike after a bare interval of about 1 in. cylindrical, about ½ in. long; terminal appendage very oblique at the base, rather thick and about 1 in. long in the typical form.—F. Muell. Fragm. viii. 187; Bot. Mag. t. 6180; *Arum orixense*, R. Br. Prod. 336, but not of Roxb.

Queensland. Burnett River; *F. Mueller;* Rockhampton and neighbourhood, *Thozet*, *Bowman;* Rockingham Bay, *Dallachy*.

N. S. Wales. Port Jackson, *R. Brown;* Hastings River, *Beckler;* New England, *C. Stuart*.

Var. *eliosurum*, F. Muell. Leaf-lobes narrow, terminal appendage of the spadix 2 to 3 in. long.—Manly Beach, *Wilhelmi*.

4. **T. angustilobum,** *F. Muell. Fragm.* x. 66.—Leaf-lobes 3, narrow-linear, 5 to 7 in. long and 1 to 1½ lines broad. All the other characters given apply entirely to the *T. Brownii* var. *eliosurum*.

Queensland. Gilbert River, *Armitage*. A single specimen, of which I have been unable to examine the spike.

2. BRACHYSPATHA, Schott.

Spatha broadly convolute at the base, the lamina open, shorter than the spadix. Flowers unisexual, the females at the base of the spadix, the males immediately above them, without the intervention of any neutral organs or bare interval, the sterile end of the spadix long and narrow, continuous with the rhachis. Perianth none. Anthers 2-celled, sessile in pairs (or 4 1-celled), the cells opening in terminal pores. Ovary sessile or nearly so, 2-celled, with 1 erect ovule in each cell. Stigma peltate-capitate, on a very short style. Berry usually 1-seeded. Seed albuminous.—Herbs with a broad depressed tuberous rhizome. Leaves radical, compound. Scapes radical, with 2 or 3 sheathing scales at their base.

The genus as limited by Schott comprises very few species from Ceylon and the Archipelago, of which the Australian species is one.

1. **B. variabilis,** *Schott, Syn. Aroid.* 35.—Leaf-petiole often above 1 ft. long, the common rhachis divided into 3 branches, each branch once or twice bifid, the whole lamina expanding to 1 ft. diameter or more, bearing both above and below the forks a few very unequal segments, mostly acuminate, some oblong-elliptical and 3 to 4 in. long, others ovate and 1 in. or shorter, all membranous, penniveined with rather numerous fine veins, tapering at the base and shortly petiolulate

or sessile and decurrent. Scape above 1 ft. Spatha acuminate, spreading, 4 to 5 in. long. Flowering portion of the spadix about 2 in., the male part much longer than the female, the terminal appendage narrow, slightly fusiform, often 8 to 10 in. long or even more.—*Amorphophallus variabilis*, Blume, Rumphia, i. 146, t. 35.

N. Australia. North coast, *R. Brown*; Port Darwin, *Schultz*, *n.* 562.

The species is also in the Malayan Archipelago. R. Brown, Prod. 337, referred the leaves of this plant, which he had gathered on the North Coast, to *Dracontium polyphyllum*, to which he gave the floral characters derived from other sources. There is indeed a striking resemblance between the leaves of the two plants, requiring a close comparison of the venation to distinguish them. The genus *Dracontium* however, with very different flowers, is hitherto only known from tropical America and west tropical Africa.

3. COLOCASIA, Schott.

Spatha with a convolute persistent base, the lamina long lanceolate deciduous. Flowers unisexual, the females at the base of the spadix separated from the males by short ovoid neutral organs without any bare interval, the barren terminal appendage above the males usually very short and sometimes obsolete. Perianth none. Anthers usually 4 or 2, 2-celled (or 8 or 4, 1-celled) the cells opening in terminal pores. Ovary 1-celled, with several, often numerous ovules, on a parietal placenta; stigma peltate, on a very short thick style, or almost sessile. Berries small, enclosed in the persistent base of the spatha, with several often numerous seeds. Albumen copious.—Scapes and leaves radical, the lamina often very large, cordate or peltate, undivided.

The genus as limited by Schott consists of very few species from the warmer regions of the Old World. The two Australian species are also widely dispersed in tropical Asia and one of them is very extensively cultivated.

Leaves peltate. Ovules numerous . . . . 1. *C. antiquorum.*
Leaves broadly hastate-cordate. Ovules rather few . . . 2. *C. macrorrhiza.*

1. **C. antiquorum,** *Schott, Meletem.* 18; *Prod. Syst. Aroid.* 138.—Leaves ovate, more or less peltate and cordate, often above 1 ft. long and broad, the primary veins pinnate and pedate at the base of the leaf, the transverse veinlets arcuate and confluent in the centre of each interval. Persistent convolute base of the spatha ovoid-oblong, usually about 1½ in. long, the lamina 6 in. long or more. Spadix much shorter, the female base ¾ to 1 in. long, the neutral part shorter, the male portion rather longer, the terminal appendage much shorter and sometimes obsolete. Stigmas almost sessile.—F. Muell. Fragm. viii. 187; Wight, Ic. t. 786; *Caladium acre*, R. Br. Prod. 336.

Queensland. Endeavour River, *Banks and Solander*; Rockingham Bay, *Dallachy*. The species is much cultivated in tropical Asia and Africa, and often gathered as wild, but its real native country is not well ascertained.

2. **C. macrorrhiza,** *Schott, Meletem.* 18.—Leaves often 2 ft. long

or more, very broadly hastate-cordate, with the venation of *C. antiquorum*, but not at all or only very slightly peltate. Spatha and spadix very similar to those of that species as far as can be ascertained from imperfectly dried specimens, the laminæ of the spatha rather broader and the terminal appendage of the spadix longer. Anthers usually 2, 2-celled (or 4, 1-celled) to each flower or cluster. Ovary 1-celled, with fewer ovules than in *C. antiquorum*, and all attached at or near the base of the cavity. Stigma nearly sessile, broad, peltate or slightly lobed. Berries ovoid, 2 or 3 lines long, usually ripening 3 or 4 seeds.—F. Muell. Fragm. viii. 187; *Caladium macrorrhizon*, R. Br. Prod. 336, *Alocasia macrorrhiza*, Schott, Prod. Syst. Aroid. 146.

Queensland. Ipswich, *Nernst.*; Rockhampton, *Thozet*; Rockingham Bay, *Dallachy*; Port Denison, *Fitzalan*.
N. S. Wales, Hastings River, *Beckler*; Richmond River, *Mrs. Hodgkinson*.

I have not found any specimen in Brown's herbarium. The species is widely spread over tropical Asia and the Pacific Islands.

4. RHAPHIDOPHORA, Hassk.

Spatha open to the base, usually very deciduous. Flowers hermaphrodite or the lower ones without stamens, in a cylindrical spike covering the whole of the spadix. Perianth none. Stamens 4 to 6, adnate to the sides of the ovary, or the anther-cells free, opening outwards in longitudinal slits. Ovary with a thick angular fleshy truncate apex filled with raphides inside, and a small basal cavity, 1-celled or imperfectly 2-celled, with few ovules; stigma adnate to the centre of the truncate apex. Seeds albuminous.—Stems climbing on trees and rooting in the lower part. Leaves large and deeply pinnatifid or in species not Australian smaller and entire.

The genus as limited by Schott comprises a few species from East India or the Malayan Archipelago, one of which is also the Australian one.

1. **R. pinnata,** *Schott in Bonplandia*, v. 45; *Prod. Syst. Aroid.* 384.—Stems climbing on trees to a great height. Leaves often 3 ft. long and 1 ft. broad, deeply pinnatifid or almost pinnate, the segments lanceolate falcate with more or less incurved points, sometimes connected to about ½ in. from the centre, sometimes distinct almost to the rhachis, the terminal ones often united in a large broad lobe, all except the lowest penniveined with a prominent central nerve and fine oblique veins starting from it, and also numerous fine veins starting from the general midrib or rhachis of the leaf, the lower lobes sometimes with only the fine veins, the base of the leaf cordate truncate or almost acute. Spatha very deciduous; leaving a cylindrical spike of 3 or 4 in., but very imperfect in the Australian specimens seen.—*R. vitiensis* and *R. Cunninghamii*, Schott, in Bonplandia, ix. 367.

Queensland. *A. Cunningham*; Rockingham Bay, *Dallachy*; Fitzroy Island, *Walter*; Port Denison, *Fitzalan*. The species is also in the Malayan Archipelago and the South Pacific Islands.

Schott distinguishes the three species cited above by the venation, the depth of the lobing, and the cordate or non-cordate base of the leaf, differences which may be seen in different leaves of the same gathering. The Australian specimens, although rather numerous, are very unsatisfactory as to the flowers, with two only of them are detached portions of the spike, in one, probably not yet in full flower, the anthers are oblong with parallel cells on the side of the thick apex of the ovary, in the other there remain only a few anthers with short divaricate anthers shortly protruding above the ovary. The stigma is oblong, adnate to the centre of the truncate apex.

5. GYMNOSTACHYS, R. Br.

Flowers hermaphrodite, loosely packed in slender spikes without any or with a very minute spatha. Perianth of 4 scale-like segments in 2 series. Stamens 4, opposite the segments; filaments short, thick, somewhat compressed; anthers 2-celled, terminal, the cells opening outwards. Ovary oblong, 1-celled, with 1 ovule suspended from the apex; stigma sessile. Berry ovoid or globular. Seed with an appressed rather thin testa. Embryo short, in the axis of a rather hard albumen; radicle superior.—Herb with tuberous roots and very long grass-like radical leaves. Spikes clustered in the axils of leafy bracts along a tall otherwise leafless scape.

The genus is limited to the single species endemic in Australia.

1. **G. anceps**, *R. Br. Prod.* 337.—Roots swollen into fusiform tubers. Radical leaves erect, rather rigid, strongly nerved, 1 to 3 ft. long, and usually 3 to 4 lines broad. Scapes nearly as tall, much flattened, with acute smooth or serrulate-scabrous edges. Clusters of spikes usually 3 or 4, distant from each other in the upper part of the spike, the leafy bract subtending the cluster rigid erect and shorter than the spikes. Spikes usually 2 or 3 rarely more in each cluster, on short peduncles with 2 or 3 sheathing scales at the base of each peduncle, the slender spikes very unequal, the longest often 2 to 3 in. Flowers small, sessile but not closely packed. Perianth-segments or scales obovate, truncate, not exceeding the ovary. Berries 3 or 4 lines long.—Schott, Gen. Aroid. t. 97; F. Muell. Fragm. viii. 187.

Queensland. Moreton Bay, *Backhouse*, *F. Mueller* and others; Condamine River, *Hartmann*; Rockhampton, *Bowman*, *Thozet*.

N. S. Wales. Hunter and Paterson Rivers, *R. Brown*; New England, *C. Stuart*; Hastings River, *Fraser*, *Beckler*; Clarence River, *Wilcox*; Richmond River, *Henderson*; southward to Illawarra, *A. Cunningham*; Kiama, *Harvey*.

6. POTHOS, Linn.

Spatha ovate or lanceolate, concave or flat, at length reflexed or deciduous. Flowers hermaphrodite, covering the whole spadix. Perianth of 6 obovate or cuneate concave segments or scales, in 2 series. Stamens 6 or fewer, opposite the segments; filaments flattened; anthers terminal, 2-celled, the cells opening outwards. Ovary ovoid or obovoid, 3-celled, with 1 erect ovule in each cell; stigma sessile. Berry often 1-seeded by abortion. Seed without albumen, the testa membranous but rather thick. Embryo thick and hard, with a cavity in the upper end enclosing a prominent plumula and a small cotyledonous end curved over it.—Tall climbers. Leaves usually distichous with the lamina articulate on a phyllodineous petiole. Spikes (or spadices) cylindrical or globular, terminal, or if axillary the peduncle enclosed at the base in two or more sheathing bracts.

The genus as now limited extends over tropical Asia to South China and westward to Madagascar, the only Australian one proving to be the same as one from the Philippine Islands and South China.

1. **P. Loureiri,** *Hook. and Arn. Bot. Beech. Voy.* 220.—A glabrous climber, clinging to the stems of trees and sometimes covering the tallest of them. Leaves exceedingly variable in the Australian specimens, the phyllodineous petiole sometimes linear-lanceolate 5 or 6 in. long, not 3 lines wide and rounded at the end, without any or only a very small lamina, and passing gradually from that to oblanceolate, 1½ to 4 in. long, 3 to 9 lines broad at the upper end, where it is rounded or truncate or broadly or deeply obcordate, the lamina from ovate-acuminate to lanceolate, almost always shorter than the petiole but sometimes longer by 2 in., narrower or rarely broader than the petiole, rounded or narrowed at the base. Spikes shortly pedunculate, cylindrical, 1 to 2 in. long when in flower, sometimes nearly 3 in. when in fruit. Spatha lanceolate, varying from shorter to rather longer than the spadix. Berry red, oblong or ovoid, 5 to 6 lines long.—Schott, Aroid. 23, t. 49; *P. longipes*, Schott, Aroid. 23, t. 47 (there placed in the wrong section from not having seen the fructification, but correctly transferred in Prod. Syst. Aroid. 568); *P. cylindricus*, Presl, Schott, Aroid. 23, t. 48; *P. australasicus*, F. Muell. Fragm. i. 62.

Queensland. Moreton Bay, *F. Mueller;* Pine River, *W. Hill;* Port Mackay, *Nernst;* Rockingham Bay, *Dallachy;* Mount Dryander, *Fitzalan.*

N. S. Wales. Hastings, Clarence, Macleay, and Richmond Rivers, *Beckler* and others; Bellinger River, *C. Moore;* Tweed River, *Guilfoyle.*

The species is also in the Philippines and South China. The characters by which Schott sought to distinguish the Chinese *P. Loureiri* and the Philippine Island *P. cylindricus* from the Australian plant, are all to be met with in one or another of the Australian specimens. The species has sometimes the foliage of the common *P. scandens*, but is readily distinguished by the spike, elongated and cylindrical, not globular or ovoid.

ORDER CXXXVI. TYPHACEÆ.

Flowers unisexual, very closely packed in separate heads or spikes along a common rhachis, the upper ones males, the lower females, intermixed in the spikes with linear or spathulate scales or long hairs, often forming more or less definite perianths around the stamens or ovaries. Stamens 3 or fewer to each flower; anthers erect, narrow, the cells placed back to back and opening in longitudinal slits. Ovary of a single carpel, containing a single pendulous ovule, and tapering into a simple style, with an adnate unilateral stigma. Fruit a small 1-seeded nut, with a membranous or drupaceous pericarp. Seed pendulous, with a membranous testa, and mealy albumen. Embryo axile, linear, straight, with a superior radicle. — Reed-like marsh or aquatic herbs, with long linear parallel-veined leaves, sheathing at the base.

The Order is limited to the two genera represented in Australia and both of them widely distributed over the globe, especially in temperate regions.

Flowers in cylindrical spikes, the females enveloped in a soft dense copious down formed of numerous long capillary bristles	1. TYPHA.
Flowers in globular heads, the ovaries surrounded by about 6 linear scales or perianth-segments	2. SPARGANIUM.

1. TYPHA, Linn.

Spikes cylindrical, the upper male portion contiguous with the lower female portion, or separated from it by a bare interval. Stamens in the male portion intermixed with filiform or slightly spathulate scales. Ovaries in the female portion surrounded by tufts of long hairs, affixed to the stipes, falling off with the fruit and assuming the aspect of a pappus at its base.

The genus consists of very few species widely spread over the temperate regions of the globe, especially in the northern hemisphere, and found also within the tropics both in the new and the old world; the single Australian one, which is also in New Zealand, although specifically distinguished by some botanists, appears to be really identical with one of the common northern and tropical ones.

1. **T. angustifolia,** *Linn.; Kunth, Enum.* iii. 9 Stems erect, 2 to 4 ft. high in some localities, attaining 8 to 12 ft. in West Australia according to Oldfield. Leaves often as long as or longer than the stems, mostly about 3 lines but sometimes above 4 lines broad, the dilated margins of the lower ones forming a sheath of 6 in. to 1 ft. Female spike a soft dense brown cylindrical cushion, 3 to 5 or rarely 6 in. long, 3 or 4 lines diameter at the time the male is in flower, thickening out to ¾ or nearly 1 in. diameter as the fruit ripens. Male spike usually at an interval of ½ to 1 in. from the female, very rarely close above it. Male flowers consisting of 2 or 3 linear anthers sessile on a short common stipes, the cells crowned by the hemispherical end of the connective, the flowers surrounded by filiform or slightly spathulate scales shorter than the anthers. Ovaries in the female spike fusiform, concealed as well as the fruits among the long hairs irregularly inserted on the short stipes, and tapering into a style rarely as long as those hairs. Fruits small, obovoid or fusiform, contracted into a stipes, the thin membranous pericarp free from the seed.—R. Br. Prod. 338; Hook. f. Fl. Tasm. ii. 39.

N. Australia. Port Essington, *Armstrong*; in the interior, *M'Dougal Stuart's Expedition*.

Queensland. Moreton Ireland, *M'Gillivray*; Rockhampton, *Thozet* and others.

N. S. Wales. Port Jackson, *R. Brown*; Richmond River, *Mrs. Hodgkinson*.

Victoria. Mitta Mitta, *F. Mueller*; Wimmera. *C. Green*.

Tasmania. *R. Brown*; common in marshes or banks of rivers, etc., *J. D. Hooker*.

W. Australia. Swan River, *Preiss*, *n.* 1874; Murchison River, *Oldfield*.

The species is generally distributed over the area of the genus.

I have found no specimens in Brown's herbarium and I give his stations from the Prodromus. Lehmann, in Pl. Preiss. ii. 3, refers Preiss's specimen, which has the male and female spikes exceptionally contiguous, to the European *T. Shuttleworthii*, Sond., with which Rohrbach asserts that it has no connection. Rohrbach, on the other hand distinguishes under the name of *T. Muelleri* (Rohrb. in Verhandl. Bot. Verein Brandenb. 1869, 95) the majority of the Australian specimens, chiefly from the texture of the testa of the seed, in which he finds the cells of the external layer much broader than long, instead of being equally long and broad, a histological character of no practical use. I cannot confirm the other distinction given in the shape of the stigma, which varies in being rather more or less decurrent on the style in the European as in the Australian plant.

2. SPARGANIUM, Linn.

Flowers in globular heads distant from each other along the rhachis, one or more upper ones male and sessile, the lower ones female and sessile or the lowest pedunculate. Stamens in the males though very closely packed yet more or less distinctly in threes, surrounded by about 6 linear or spathulate scales; anthers small, oblong or linear, on filaments longer than the scales. Ovaries in the females nearly sessile, each surrounded by about 6 linear scales, tapering into a style projecting beyond the scales. Fruits obovoid or fusiform, contracted at the base and usually falling off with the surrounding scales. Pericarp drupaceous, with a thin epicarp and hard indehiscent endocarp.

The genus, like *Typha*, consists of a small number of species widely spread over the northern hemisphere, but the Australian species which is also in New Zealand, though nearly allied to one of the northern ones, appears to be distinguishable by characters that may be regarded as specific.

1. **S. angustifolium,** *R. Br. Prod.* 338, *not of Michx.*—Stems from a shortly creeping rhizome erect, not very stout, 1 to 2 ft. high or rarely more. Lower and radical leaves very long, mostly 1 to 2 lines broad, the midrib acutely prominent underneath, the lower portion expanding into long many-nerved rather narrow sheaths. Inflorescence simple or with one short branch in the axil of the uppermost leaf, with leafy bracts under several of the lower heads. Heads few or numerous, all sessile or the lowest one pedunculate. Filaments of the males about twice as long as the scales. Ovaries in the females tapering into a thick style, with the stigma decurrent about halfway down. Fruits

sessile or nearly so, broadly obovoid, very obtuse, mucronate with the persistent remains of the style.

Queensland. Brisbane River, Moreton Bay, *F. Mueller* and others.

N. S. Wales. Port Jackson, *R. Brown* (no label in his herbarium); Richmond, *Woolls*; New England, *C. Stuart*; Hastings River, *Beckler*.

Victoria. Yarra, Lake Omeo, Mount Emu Creek, and Ovens River, *F. Mueller.*

This plant has the simple inflorescence foliage and habit of the erect varieties of the northern *S. simplex*, but has not the narrow acuminate fusiform fruit of that species. The fruit is more like that of *S. ramosum* but smaller.

Var.? *latifolium.* Leaves about ½ in. broad and the inflorescence sometimes slightly branched, the specimens not yet in fruit.—N. S. Wales, *Leichhardt*, *Woolls*, *Oldfield.* These specimens seem to show some approach to the common northern *S. ramosum.* Can they have been introduced?

ORDER CXXXVII. LEMNACEÆ.

Floating plants, without distinct stems or real leaves, but consisting of small sometimes minute leaflike fronds, either separate or cohering 2 or 3 together by their edges, emitting in most species one or more fibres from their under surface into the water, and multiplying by similar fronds growing out of their edges. Flowers very rare, appearing from a fissure in the edge or upon the upper surface of the frond, and consisting of a minute membranous bract or spatha, enclosing 1 or 2 stamens and a single ovary. Perianth none. Filaments usually shortly exserted, anther 1- or 2- celled. Ovary 1-celled, with 1 or more ovules. Style short, with a slightly thickened stigma. Fruit a minute utricle. Seeds 1 or more, with or without albumen.

The Order, usually limited to the two genera represented in Australia, is widely spread over the globe in ponds or standing waters. The Australian species, if correctly identified, have all a wide range, at least in the Old World. There is however considerable difficulty in determining many of the specimens preserved in herbaria, as they are not in fructification. The Lemnaceæ have indeed been recently worked up with great care by Professor F. Hegelmaier, of Tübingen, in an elaborate treatise illustrated by 16 plates (Die Lemnaceen, Leipzig, 1868, 4to), but the characters given to distinguish the species independently of the fructification cannot well be practically ascertained without a patient study with the aid of a powerful microscope. I have therefore here confined myself to the more obvious distinctions of the principal species without entering into the minute particulars by which some of the Australian forms might be separated, referring for further details to Hegelmaier's work, which must be consulted by all those who would make a special study of these curious organisms.

Fronds minute, emitting no fibres, flowering in a cavity on the upper surface . . . . 1. WOLFFIA.
Fronds emitting from their under surface one or more fibres, and flowering in a fissure of the margin . . . . 2. LEMNA.

1. WOLFFIA, Horkel.

Fronds minute, emitting no fibres. Flowers bursting from a cavity on the upper surface of the frond, without any spatha or bract. Anther 1, globular, nearly sessile, opening in 2 valves. Ovary globular with a single erect ovule; style short with a broad stigma.

1. **W. arrhiza,** *Wimm.; Hegelm. Lemn.*, 124, t. 2, 3, var. *australiana.*—Fronds mostly about ½ line diameter, as broad as long, very thin except the thickened side whence the new frond arises, whilst in the typical *W. arrhiza* they are scarcely above ¼ line diameter and thick all over. Fructification of the Australian form unknown.—*Lemna arrhiza,* Linn.; *Wolffia Michelii,* Schleid.; F. Muell. Fragm. viii. 187.

Victoria. Mount Emu Creek, where it is not mixed with other Lemnaceæ, Lake Towang and swamps near Mount Gilibrand, mixed with *Lemna minor, F. Mueller.*

F. Mueller, Fragm. viii. 188 informs us that Hegelmaier, to whom he appears to have communicated specimens of the plant, could not in the barren state of the fronds safely distinguish it from *W. arrhiza,* although it looks very different from all our specimens of that species whether from Europe or East India. I do not find however any single frond attaining 1 to 1½ lines as described by F. Mueller, nor any one twice as long as broad, though here and there two fronds are closely joined together so as almost to look like one.

2. LEMNA, Linn.

Fronds emitting one or more root fibres from their under surface. Flowers issuing from a fissure in the margin of the frond. Anthers with 2 distinct cells, each opening in two valves, at the end of a distinct filament. Style short or more or less lengthened.

Geographical distribution that of the Order.

Root-fibres one to each frond.
  Fronds very thin, oblong or narrowed at one end, the young ones often projecting on each side at both ends. Ovule 1 . . . . 1. *L. trisulca.*
  Fronds broadly ovate, rather thin, slightly convex underneath, the young ones soon detached from one side. Ovule 1 . . . . 2. *L. minor.*
  Fronds of *L. minor* but rather thicker. Ovules 2 or more . . . . 3. *L. gibba.*
Root-fibres several in a cluster under each frond.
  Fronds thin, oval or oblong, rarely above 2 lines long . . 4. *L. oligorrhiza.*
  Fronds herbaceous, usually orbicular and nearly 3 lines diameter . . . . 5. *L. polyrrhiza.*

1. **L. trisulca** *Linn.; Hegelm. Lemn.* 134, t. 5, 6.—Fronds oblong or lanceolate, often ½ in. long and about half that breadth, thin, narrow and minutely toothed at one end and ending in a little stalk at the other, with 2 young ones usually growing from opposite sides and remaining long adherent, and emitting a single root

from underneath. Stamens usually 2. Ovary with 1 ovule and a very short style.—R. Br. Prod. 345; Hook. f. Fl. Tasm. ii. 38; F. Muell. Fragm. viii. 188.

N. S. Wales. Port Jackson, *R. Brown;* sources of the Gwydir, *Leichhardt.*
Victoria. Murray River, *F. Mueller.*
Tasmania, *R. Brown;* in still waters, but less frequent than *L. minor*, *J. D. Hooker.*

Common in the northern hemisphere. Brown's stations for this and the following species are taken from his Prodromus, I have not seen his specimens.

2. **L. minor,** *Linn.; Hegelm. Lemn.* 142, t. 9, 10.—Fronds usually broadly ovate, about 2 lines long, rather thin, emitting a single root from the under surface, the young frond growing from one side, becoming soon detached. Stamens usually 2. Ovary with a single ovule.—R. Br. Prod. 345; Hook. f. Fl. Tasm. ii. 38; F. Muell. Fragm. viii. 188.

Queensland. Rockhampton, *O'Shanesy, Bowman;* Brisbane, *Bailey.*
N. S. Wales. Port Jackson, *R. Brown.*
Victoria. In the Yarra, *F. Mueller.*
Tasmania, *R. Brown;* abundant, *J. D. Hooker.*
W. Australia, *Drummond?*

The commonest species in most parts of the area of the genus.

3. **L. gibba,** *Linn.; Hegelm. Lemn.* 145, t. 11, 12.—Fronds of the size and shape of those of *L. minor* and similarly emitting a single root from the underside, but much thicker, convex underneath, and the ovary has 2 or more ovules.

W. Australia, *Oldfield, Drummond, n.* 178?

Widely spread over the area of the genus, but not so common as *L. minor.*

Oldfield's specimens have a few flowers and Hegelmaier appears to have examined them and ascertained them to belong to *L. gibba.* Drummond's specimens are precisely similar, with the same thick fronds but are not in fructification. Hegelmaier has named one patch of them in herb. Hooker *L. paucicostata* (Hegelm. Lemn. 139. t. 8), which he distinguishes from *L. minor* chiefly upon histological characters which I have been unable fully to appreciate, and the majority of the specimens (chiefly East Indian) named by him *L. paucicostata*, certainly appear to me to be referrible to the common thin-fronded *L. minor.*

4. **L. oligorrhiza,** *Kurz; Hegelm. Lemn.* 147, t. 16.—Fronds thin, oval or oblong, resembling those of *L. minor*, but usually rather larger though rarely much above 2 lines long, 3- or 5-nerved, and emitting from the underside a cluster of several roots or fibres, usually 2 to 5 but sometimes more. Fructification unknown.—*L. pleiorrhiza* and *L. melanorrhiza*, F. Muell.; Kurz in Seem. Journ. 1867, 115.

Queensland, *Bowman*
N. S. Wales. Paramatta, *Woolls.*
Victoria. Entrance of the Murray River, *F. Muell.*

The species appears to be spread over East India and the Malayan Archipelago

5. **L. polyrrhiza**, *Linn.*—Fronds very broadly ovate or most frequently orbicular, mostly nearly 3 lines diameter, rather thin but more herbaceous than most species and often darker coloured, emitting from the underside a cluster of several often many fibres. Fructification only very imperfectly known, the ovary said to have 2 erect ovules.—*Spirodela polyrrhiza*, Hegelm. Lemn. 151. t. 14, 15.

N. S. Wales, *Leichhardt.*
Victoria. Lagoons of the Towang, *F. Mueller.*

Generally spread over the area of the genus, though not so common as *L. minor*. Appears to be rather frequent in East India.

ORDER CXXXVIII. NAIADEÆ.

Flowers hermaphrodite or unisexual, regular or very imperfect. Perianth of 6, 4 or 3 small scale-like segments or rudimentary or none. Stamens 6 or fewer; anthers erect, sessile or nearly so at the base of the segments or on the receptacle, usually 2-celled, opening outwards in longitudinal slits. Ovary of 6 or fewer carpels, distinct or rarely more or less connate or solitary, tapering into distinct entire or branched styles or with sessile stigmas; ovules 1 or rarely several in each cell, laterally attached at or above or rarely below the middle. Fruit of 6 or fewer or single indehiscent nutlets, or rarely follicular carpels opening inwards in a longitudinal slit. Seed attached at or below the summit, straight curved or more or less coiled, with a thin testa and no albumen. Embryo the shape of the seed or more coiled or hooked at the upper cotyledonous end, the plumula frequently prominent from a dorsal cavity.—Aquatic floating or submerged plants or rarely erect marsh herbs with radical leaves. Flowers small, usually green, in spikes heads or solitary, on axillary peduncles or radical scapes, or entirely enclosed in the sheathing bases of floral leaves or bracts.

The Order, like *Alismaceæ*, is represented in the marshes, ponds, and shallow waters of most parts of the world, and includes some exclusively marine genera as widely dispersed. Of the nine Australian genera six have a very wide range over the waters of both hemispheres, two are limited to the shores of the Old World, and one only, *Lepilæna*, is endemic. The deficiency or very reduced state of the perianth and sessile anthers opening outwards readily distinguish the order from *Alismaceæ*, which are otherwise its nearest allies.

TRIBE I. **Potameæ.** *Flowers hermaphrodite. Anthers short and broad, sessile at the base of the scale-like perianth-segments. Carpels* 3 *to* 6, 1-*seeded.*

Flowers usually 3-merous or 6-merous. Carpels frequently cohering till ripe. Marsh or aquatic plants, with erect scapes and erect grasslike or rarely floating leaves . . 1. TRIGLOCHIN.
Flowers usually 4-merous. Carpels free. Aquatic plants with submerged or floating stems and leaves and axillary peduncles . . . . 2. POTAMOGETON.

TRIBE II. **Zostereæ.** *Flowers hermaphrodite or unisexual. Perianth none or rudimentary or in one sex only. Carpels* 1 *to* 3 *or rarely more,* 1-*seeded or rarely several-seeded. Aquatic submerged plants, mostly marine or subsaline.*

Flowers hermaphrodite, spicate. Leaves alternate.
  Spikes enclosed when young in the sheathing bases of floral leaves. Stamens 2. Carpels 2 at first sessile, but when in fruit on long stalks . . . . 3. Ruppia.
  Spikes several on a long scape, each with 2 sheathing bracts at the base in the axils of a floral-leaf. Stamens 3. Carpel 1, sessile. Marine plant . . . . 4. Posidonia.
Flowers unisexual, spicate. Leaves alternate. Spikes androgynous enclosed in the base of floral leaves. Stamens and carpels solitary . . . . 5. Zostera.
Flowers unisexual, solitary within the sheathing bracts. Leaves alternate. Anthers 2 or 3, dorsally connate.
  Anthers 2. Carpels 2. Marine plants . . . . 6. Cymodocea.
  Anthers and carpels usually 3. Subsaline aquatic plants 7. Lepilæna.
Flowers unisexual, solitary. Leaves opposite. Carpels solitary.
  Anther 1. Carpel 1-seeded . . . . 8. Naias.
  Anthers 3. Carpel several-seeded . . . . 9. Halophila.

Tribe I. Potameæ.—Flowers hermaphrodite. Anthers short and broad, sessile at the base of the scale-like perianth-segments. Carpels 3 to 6, 1-seeded.

1. TRIGLOCHIN, Linn.

(Cycnogeton, *Endl.* Maundia, *F. Muell.*)

Flowers hermaphrodite or rarely polygamous. Perianth-segments scale-like, 3, 6 or fewer. Stamens as many or fewer, inserted at the base of the segments and falling off with them; anthers sessile, broad, the cells opening outwards in longitudinal slits. Carpels normally 6, but 3 alternate ones sometimes reduced to empty laminæ, all more or less united in the axis at the time of flowering or distinct from the first, the short terminal styles or stigmas always distinct. Ovules solitary in each carpel, laterally attached below the middle. Fruit of 6 or 3 indehiscent deciduous 1-seeded nutlets, the 3 empty carpels of some species remaining attached to a central axis and assuming the appearance of dissepiments of a capsule. Seed erect, cylindrical or ovoid, the testa membranous; embryo straight, the shape of the seed.—Marsh or aquatic herbs. Leaves all in radical tufts, linear or filiform. Scapes erect, simple and leafless, bearing a terminal spike of small flowers sessile or shortly pedicellate, without bracts.

The genus is spread over a great part of the globe, but mostly in extratropical or subtropical regions. Of the 5 Australian species, one is generally spread over northern as well as southern temperate and subtropical America, South Africa, and New Zealand, the others appear to be all endemic. *Triglochin*, with its nearest ally *Scheuchzeria*, forming the tribe of *Juncagineæ* is usually placed under or next to, *Alismaceæ*, but it appears to me to be much more nearly connected with *Potamogeton*. in the peculiar structure of the flowers, differing chiefly in habit, and even in that respect, the half-floating leaves of *T. procera* show a near approach to that genus. The generic name has been generally, after the example of Linnæus and others, treated as neuter, but modern purists have called attention to the feminine gender of the Greek word from which it is derived.

Sect. I. **Eutriglochin.**—*Fruits with 3 perfect deciduous nutlets, leaving a central* *axis with 3 thin barren carpels resembling dissepiments. Stamens usually 3 perfect or in the terminal flower 6.*

Stock stoloniferous. Scape usually 3 in. to nearly 1 ft. high. Fruit nearly orbicular . . . . 1. *T. striata.*
Dwarf plants without stolones. Scape usually under 3 in. high.
  Fruit narrow, the perfect carpels with an angle or short spur at the base . . . . 2. *T. centrocarpa.*
  Fruit broadly obovate or angular-turbinate, truncate at the top with the outer angles mucronate . . . . 3. *T. mucronata.*

SECT. II. **Cycnogeton.**—*Fruits with 3 to 6 perfect nutlets, without any barren ones or persistent axis. Stamens usually 6, rarely 4 or 5.*

Scapes 1 to 3 ft. high. Leaves long. Carpels 6, rarely 3, more or less united, at least when in flower or rarely free from the first . . . . 4. *T. procera.*
Scapes tall, with a sheath at the base. (Leaves none?). Carpels 2 or 3, united to the apex, at least when in flower. Nutlets almost drupaceous . . . . . . 5. *T. Maundii.*

SECT. I. EUTRIGLOCHIN.—Fruits with 3 perfect deciduous nutlets, leaving a central axis with 3 thin barren carpels resembling dissepiments. Stamens usually 3 perfect or in the terminal flower 6.

1. **T. striata,** *Ruiz et Pav. Fl. Per. et Chil.* iii. 72.—Rootstock small, stoloniferous. Leaves from narrow-linear and about 1 line broad to almost filiform, very variable in length but almost always shorter than the scape. Scape from 2 or 3 in. to nearly 1 ft. high, flowering from below the middle. Flowers shortly pedicellate, often very numerous. Outer perianth-segments broadly ovate, about ½ line long, the inner ones smaller and narrower or sometimes wanting. Perfect anthers 3 at the base of the outer segments, those at the base of the inner segments fleshy and without pollen or deficient and some flowers occasionally without any anthers. Fruits orbicular or nearly so, 1 to 1½ lines long, with 6 prominent angles or ribs, 3 larger ones being perfect carpels, laterally compressed with 1 or 3 dorsal ribs, and falling off at maturity, leaving 3 thin empty carpels united to the central axis and having then the appearance of the dissepiments of a 3-celled capsule.—F. Muell. Fragm. vi. 83; *T. decipiens*, R. Br. Prod. 343; *T. filifolium*, Sieb. in Spreng. Syst. Cur. Post. 142, also of Hook. Ic. Pl. t. 579; *T. triandrum*, Mich. Fl. Bor. Amer. i. 208, Hook. f. Fl. Tasm. ii. 40; *T. montevidense*, Spreng. Syst. ii. 145, Seub. in Mart. Fl. Bras. iii. part i. t. 12.

Queensland. Moreton Island, *M'Gillivray*; Brisbane River, *F. Mueller.*

N. S. Wales. Port Jackson, *R. Brown*, *Sieber*, *n.* 174; Richmond River, *Mrs. Hodgkinson*; Clarence River, *Wilcox.*

Victoria. Mouth of the Glenelg, *Allitt*; Melbourne, *Adamson*, *F. Mueller*; Mount William, *Sullivan*; Curdie's River; *F. Mueller*; Little River, *Fullagar.*

Tasmania. Salt Marshes, abundant, *J. D. Hooker* and others.

S. Australia. St. Vincent's Gulf, *F. Mueller.*

W. Australia. King George's Sound, *R. Brown*; thence to Swan River, *Drummond*, *Preiss*, *n.* 2404.

The larger specimens with 3 prominent staminodia have usually broader leaves than the others.

The species is widely spread over extratropical South America and is also in North America and in New Zealand. The Magellan plant however referred to by Grisebach appears to me to be quite distinct both in the rootstock and in the form of the fruit and is probably the true *T. maritima.*

2. **T. centrocarpa,** *Hook. Ic. Pl. t.* 728.—A dwarf slender plant usually densely tufted. Radical leaves subulate, often all under ½ in. rarely rather above 1 in. long. Scapes usually 1 to 2 in. long, or in luxuriant specimens twice as much, very slender, bearing fruits from below the middle. Flowers minute, in a short dense inconspicuous spike, which soon elongates so as to occupy half the scape. Perianth-segments from broadly ovate-acute to lanceolate and acuminate, ¼ to ½ line long, from scarcely exceeding to twice as long as the anthers, the lower flowers often with only 1 anther-bearing segment and 2 lateral empty ones, the others with 3 or rarely 6 segments, all anther-bearing, but the majority of the numerous specimens seen are in fruit with the perianth and stamens fallen away. Fruit linear, usually about 2 lines, but varying from 1 to 3 lines long, with 3 perfect cells, truncate at the top and obtuse or more or less 3-toothed with the three stigmas, each perfect carpel 3-ribbed on the back, the lateral ribs with either a prominent angle or a tooth or spur at the base, the 3 barren carpels sometimes as thin as in *T. striata*, sometimes as thick as the perfect ones but solid inside, and in some small specimens only one seed ripens in the whole fruit.—Hook. f. Fl. Tasm. ii. 40; Endl. in Pl. Preiss. ii. 54; *T. nanum*, F. Muell. in Trans. Vict. Inst. 1855, 135, and in Hook. Kew. Journ. viii. 332, Fragm. vi. 82.

Victoria. Wendu Vale, *Robertson*, near Melbourne, *Harvey;* Brighton, Hopkins River, Station Peak, etc., *F. Mueller;* Murray River, *Dallachy.*

Tasmania. Abundant in sandy moist places, *J. D. Hooker.*

S. Australia. Barossa Range and Holdfast Bay, *F. Mueller.*

W. Australia. King George's Sound to Swan River, *F. Mueller*, *Drummond*, *1st. coll. n.* 682 *and n.* 313, *Preiss*, *n.* 2409 and 2411; Murchison and Vasse Rivers, *Oldfield.*

The fruits in this species are exceedingly variable in size and position. In the rare form figured as above they are strictly erect, almost sessile and 2 lines long, in some Tasmanian specimens sessile or distinctly pedicellate on different scapes of the same tuft; in some luxuriant specimens from W. Australia fully 3 lines long, on short or long pedicels; in a large number of specimens from all localities scarcely more than 1 line long, erect or spreading, on pedicels varying from ½ to 3 lines; in another series from W. Australia, Tasmania, and Victoria, distinguished by F. Mueller, Fragm. vi. 82 under the name of *T. minutissima*, the fruits are also scarcely above 1 line long, but almost sessile and very spreading. This however is connected with the commoner form with longer more erect fruits by numerous intermediates. *T. trichophora*, Nees; Endl. in Pl. Preiss. ii. 54, from Rottenest Island, is a small slender form, with almost sessile spreading fruits, the terminal one distant from the others, which however Micheli is of opinion cannot be specifically separated from *T. centrocarpa*. I cannot find in any of the specimens any traces of the pendulous hairs inside the carpels mentioned by Endlicher, for which he may perhaps have mistaken the inner membrane of the pericarp, which when old splits readily almost into hairs.

Var. *calcitrapa.* Fruits fully 3 lines long, the basal spurs 1 to 1½ lines or in one fruit 2 lines long.—*T. calcitrapa*, Hook. Ic. Pl. t. 731.—Swan River, *Drummond*, *1st coll.* The figure quoted gives rather an exaggerated idea of the spur even of the single specimen drawn.

3. **T. mucronata,** *R. Br. Prod.* 343.—A dwarf tufted plant, usually 1 to 3 in. high, but in some luxuriant specimens the scape twice as long. Leaves linear-filiform, shorter than the scape. Flowers minute, with 1 to 3 or rarely 6 perianth-segments and anthers as in *T. centrocarpa.* Fruits sessile or very shortly pedicellate, sometimes only 2 or 3 on the scape, sometimes rather numerous towards the end, and in a few specimens a single fruit terminates the scape, all broadly obovoid or angular-turbinate, truncate at the top, with the upper outer angles often but not always mucronate by the persistent styles, those of the 3 perfect deciduous carpels horizontal, those of the three dissepiment-like barren persistent ones erect.—Endl. in Pl. Preiss. ii. 54; F. Muell. Fragm. vi. 81; *T. Neesii,* Endl. l. c.

Victoria. Hopkins River, Point Lonsdale, Mount Abrupt, *F. Mueller.*
S. Australia. Rivoli Bay, Port Lincoln, Kangaroo Island, *F. Mueller.*
W. Australia. King George's Sound, *R. Brown;* and thence to Swan River. *F. Mueller; Drummond, n.* 177, *Preiss, n.* 2402.

SECTION II. CYCNOGETON.—Fruits with 3 to 6 perfect nutlets, without any barren ones or persistent axis. Stamens usually 6, rarely 4 or 5.

4. **T. procera,** *R. Br. Prod.* 343.—Root-fibres swollen into ovoid or oblong tubers. Leaves from a terete base linear, flat, ¼ to above ½ in. broad, often several feet long when growing in deep water, the upper portion floating on the surface. Scapes 1 to several feet high, the terminal spike from 2 or 3 in. to above 1 foot long. Flowers very numerous, nearly sessile. Perianth-segments 6 or rarely fewer, orbicular and 1½ to 2 lines diameter, or narrower and not longer than the anthers. Carpels 6 or rarely fewer, united to above the middle or sometimes at the base only, tapering into erect or recurved stigmas. Fruits exceedingly variable, from almost orbicular to narrow-oblong, 2 to 3 lines long, straight or spirally twisted, the carpels themselves straight or falcate.—Hook. f. Fl. Tasm. ii. 40; F. Muell. Fragm. vi. 83; *T. linearis,* Endl. in Pl. Preiss. ii. 54; *Cycnogeton Huegelii,* Endl. in Ann. Wien. Mus. ii. 211, Iconogr. t. 73, and in Pl. Preiss. ii. 55; *C. linearis,* Sond. in Linnæa, xxviii. 225.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown.*
Queensland. Rockhampton and neighbourhood, *O'Shanesy, Bowman;* Brisbane River, *Bailey.*
N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, J. D. Hooker, Woolls;* New England, *C. Stuart;* Macleay River, *C. Moore;* Clarence River, *Wilcox.*
Victoria. Rivers and Creeks from the S. Australian frontier eastward, *Robertson, F. Mueller* and many others.
Tasmania. Abundant in fresh and brackish waters, *J. D. Hooker.*
S. Australia. Torrens River, *F. Mueller;* Encounter Bay, *Whittaker.*
W. Australia. Swan River, *Drummond, Preiss, n.* 2406; Lake Muir, *Muir.*

Var. *eleutherocarpa.* Fruiting carpels free from the base and very much curved, but usually 6.—W. Australia, *Drummond*, *n.* 314, *Preiss*, *n.* 2405; Blackwood and Tweed Rivers and Port Gregory, *Oldfield.*

Var. *dubia.* Carpels 3, rarely 4 or 5, curved as in the var. *eleutherocarpa* and apparently free from the first, often stipitate when in fruit.—*T. dubium*, R. Br. Prod. 343.—M'Adam Range and Robinson River, *F. Mueller;* Cape River, *Bowman;* Rockingham Bay, *Dallachy.* I find no specimen in Brown's herbarium but refer this to his species from his diagnosis.

The genus *Cynogeton* was founded by Endlicher chiefly on the presence of a second abortive ovule in each carpel. This second ovule is not mentioned by any other observer. and Hooker could not find it. I searched in vain for it in a number of carpels taken from different varieties and it is only in one that I found a minute stipitate appendage to the short funicle which might possibly be an abortive ovule, though quite shapeless.

5. **T. Maundii,** *F. Muell. Fragm.* vi. 83.—Roots apparently thick, with numerous small fibres. Stems erect, terete, leafless, 2 ft. high or more. No leaves seen except a long loose membranous sheath at the base of one of the stems. Spikes not dense, attaining 2 to 4 in. when in fruit, the flowers and fruits all sessile. Stamens 4 to 6, the anther-cells very distinct but adnate to a common connective as in the rest of the genus, the subtending perianth-segments sometimes thin, sometimes very broad and thickened at the apex. Carpels usually 2 or 3, sometimes 4, connate to the truncate apex, the stigmas broad and very spreading. Fruit about 3 lines long, cylindrical, but with 2 furrows on the back of each carpel, the carpels almost drupaceous, each with a thinly cartilaginous endocarp with an acute dorsal rib, the exocarp loose, rather thick, the 2 dorsal obtuse ribs often leaving cell-like cavities between them and the endocarp. Seed slender, cylindrical, erect. —*Maundia triglochinoides*, F. Muell. Fragm. i. 23.

Queensland. Brisbane River, Moreton Bay, *F. Mueller*, *W. Hill*, *Bailey.*
N. S. Wales. Tweed River, *Guilfoyle.*

It is probably from a clerical error that F. Mueller described the seed as pendulous. I also find 4 to 6 2-celled anthers, not 8 to 12 1-celled ones, the cells being always united in pairs by the connective.

2. POTAMOGETON, Linn.

Flowers hermaphrodite. Perianth-segments 4, scale-like, small, broad, contracted at the base or almost stipitate. Stamens 4, inserted at the base of the segments and falling off with them; anthers sessile, broad, the cells opening outwards in longitudinal slits. Carpels 4, distinct; styles short, terminal or the oblique stigmas sessile; ovules solitary in each carpel, laterally attached at or above the middle. Fruit of 4 nutlets or fewer by abortion, somewhat drupaceous, the exocarp membranous or slightly fleshy, the endocarp rather hard, crustaceous. Seed much incurved or horseshoe-shaped, round a clavate or obovoid projection of the endocarp; testa membranous. Embryo the shape of the seed.—Aquatic herbs with a perennial rootstock; stems submerged and floating usually forked and often rooting at the lower nodes. Leaves alternate or rarely opposite, wholly submerged or with a lamina floating on the surface, dilated at the base into membranous sheathing margins or more frequently the margins more or less detached from and united within the petiole into sheathing stipules often very deciduous. Flowers small, sessile in dense spikes or heads on axillary peduncles.

The genus is dispersed in the fresh or subsaline waters of the greater part of the globe. Of the nine Australian species seven are common in most temperate regions especially in the Old World, another extends over East India and the Malayan Archipelago, and one only is endemic but more nearly allied to American than to Old World species.

Kunth considers the flowers as unisexual, describing the stamens as distinct male flowers and the carpels of the ovary as separate female flowers, a view in which it seems very difficult to concur.

SECTION I.—*Leaves all alternate and petiolate with floating laminæ, or the lower ones submerged. Stipules connate within the petiole.*

Fruit-spikes cylindrical. Seed not forming a complete coil.
  Floating leaves usually 2 to 4 in. or longer. Nutlets ovoid, scarcely beaked . . . . 1. *P. natans.*
  Floating leaves ¾ to ½ in. long. Nutlets distinctly beaked . . . . 2. *P. tenuicaulis*
Fruit-heads globular. Nutlets small, not beaked. Seed forming a complete coil . . . . 3. *P. Drummondii.*

SECTION II.—*Leaves all submerged, sessile or nearly so, those under the peduncles and branches opposite, the others alternate. Stipules connate within the petiole, often very deciduous.*

Leaves stem-clasping, ovate or almost orbicular, many-nerved . . . . 4. *P. perfoliatus.*
Leaves oblong-lanceolate, many-nerved . . . . 5. *P. prælongus ?*
Leaves narrow-oblong or rarely linear, usually 3-nerved, very obtuse, the margins often undulate-crisped . . 6. *P. crispus.*
Leaves narrow-linear, obtuse or scarcely acute, 1-nerved. Spikes ½ in. long or more . . . . 7. *P. obtusifolius.*
Leaves narrow-linear, very acute, 1- or 3-nerved. Spikes short and few-flowered. Seed forming almost a complete coil . . . . 8. *P. acutifolius.*

SECTION III.—*Leaves all submerged, sessile or nearly so with sheathing margins but no distinct stipules.*

Leaves narrow-linear, 1-nerved. Stems repeatedly dichotomous . . . . 9. *P. pectinatus.*

1. **P. natans,** *Linn.; Kunth, Enum.* iii. 127.—Upper leaves or often the whole of them on long petioles, floating on the surface of the water, of a thick opaque texture, ovate or oblong, 2 to 4 in. long by 1 to 1½ in. broad, or rarely in small varieties about half that size, usually rounded at the base, but sometimes cordate or tapering, marked by several (5 to 9 or rarely 11) longitudinal nerves with a few cross veins often branched or slightly netted; lower submerged leaves usually few or often wanting, rarely all submerged thin and narrow but always tapering at the base into a stalk and several-nerved. Stipules closely sheathing, connate, free from the petiole except at the very base. Spike

dense and cylindrical, often 1 in. long or more, on a stout peduncle. Nuts ovoid, above 1 line long, slightly compressed, nearly straight, with 1 or 3 dorsal ribs, obtuse or acute, quite entire or more or less denticulate or muricate.—R. Br. Prod. 343; Hook. f. Fl. Tasm. ii. 41; F. Muell. Fragm. viii. 217; Reichb. Ic. Fl. Germ. t. 50; *P. heterophyllus*, Hook. f. Fl. Tasm. ii. 41, and of some authors, but not the true plant of Schreber.

Queensland. Rockhampton, *O'Shanesy*, *Bowman*.

N. S. Wales. Port Jackson, *R. Brown*; common in rivers and creeks, *Woolls* and many others.

Victoria. Rivers and creeks in various parts of the colony, *F. Mueller* and many others.

Tasmania. Ponds and still rivers, abundant, but usually a small-leaved variety, *J. D. Hooker* and others.

S. Australia. Murray and Tamunda Rivers, *F. Mueller*.

W. Australia, *Drummond*; Murchison River, *Oldfield*.

The species is one of the most common over the greater part of the area of the genus. The few specimens in which the floating leaves are wanting are sometimes confounded with varieties of *P. obtusifolius*, but are readily distinguished by the leaves more or less petiolate and several-nerved.

2. **P. tenuicaulis**, *F. Muell. Fragm.* i. 90, 244, viii. 217.—Perhaps a variety of *P. natans*, with which it is closely connected through the small Tasmanian variety of that species. Stems almost filiform. Floating leaves oblong-elliptical or lanceolate, ¾ to 1½ in. long, acute at the base, few-nerved. Stipules very thin. Submerged leaves few, linear. Spikes dense, 4 to 6 lines long. Nutlets smaller than in *P. natans*, more distinctly rostrate and the ribs often but not always denticulate.

N. Australia. Gulf of Carpentaria, *F. Mueller*.

Queensland. Brisbane River, *Bailey*; Moreton Bay, *Leichhardt*; Rockhampton, *Bowman*, *O'Shanesy*; Rockingham Bay, *Dallachy*; Mount Elliot, *Fitzalan*.

This is evidently the same as the Bengal plant which Indian botanists have referred to the North American *P. hybridus*, Mich. which it closely resembles in habit, foliage, and inflorescence, but the fruit is very different and the seed is not spirally coiled. It may be, as suggested by F. Mueller, the same as *P. javanicus*, Hassk. from Java, and if so, should bear that name, but the character given is insufficient for verification and we have no specimens for comparison.

3. **P. Drummondii**, *Benth.* — Floating leaves on long slender petioles, elliptical-oblong, 1 to 1½ in. long, thin and many-nerved; submerged leaves rather numerous, exceedingly thin, linear or linear-lanceolate, many in. long, usually 5-nerved, contracted into a petiole. Peduncles slender. Fruiting-spikes or heads ovoid or globular, about 3 lines diameter, with numerous small closely packed nutlets, each one scarcely 1 line long, the dorsal rib and lateral angles very prominent, the style scarcely so. Seed much curved forming usually a complete coil.

W. Australia, *Drummond*.

This differs from most old-world species and comes nearest to the N. American *P. hybridus* in its small nutlets and coiled seeds, but differs from that species in the submerged leaves remarkably large and ulva-like, the floating leaves much thinner and rather longer and the seed not quite so spiral.

4. **P. perfoliatus,** *Linn.; Kunth, Enum.* iii. 133.—Leaves all submerged, alternate except under the peduncles and branches where they are opposite, all sessile, ovate or almost orbicular, clasping the stem with broad rounded auricles which are sometimes united on the opposite side, thin and many-nerved, ¾ to 1½ in. long and often quite as broad. Stipules only on very young shoots. Peduncles longer than the leaves. Spike cylindrical, rarely above 6 to 8 lines long. Nutlets scarcely beaked.—R. Br. Prod. 343; F. Muell. Fragm. viii. 219; Reichb. Ic. Fl. Germ. t. 29.

N. S. Wales. Hunter's Patersons and Williams Rivers, *R. Brown.*
Victoria. Tambo and Lake Wellington, *F. Mueller.*
Tasmania. South Esk River, *C. Stuart.*

Common in the northern hemisphere.

5. **P. prælongus,** *F. Muell. Fragm.* viii. 217, *but perhaps not of Wulf.*—Leaves all submerged, alternate except under the peduncles and branches where they are opposite, mostly stem-clasping, oblong-lanceolate, obtuse, more or less contracted at the base, 2 to 4 in. long, the margins slightly crisped, many-nerved but the midrib broad and very prominent underneath towards the base, the lateral nerves fine and often faint. Stipules short and thin, very soon disappearing. Peduncles mostly shorter than the leaves, the flowering spike dense, 3 to 5 lines long. Fruit not seen.

Victoria. Tambo River, *F. Mueller.*
Tasmania? Specimens from South Esk River, *C. Stuart,* without flowers may possibly be the same species.

I cannot match these specimens with any of the numerous ones we have of *P. prælongus* from various parts of the world. In the typical species the stipules are remarkably conspicuous and persistent besides minor characters.

6. **P. crispus,** *Linn.; Kunth, Enum.* iii. 133.—Leaves all submerged, alternate and contracted at the base, except when under the branches or peduncles where they are opposite and stem-clasping, all linear or narrow-oblong, very obtuse, the margins usually undulate-crisped, 1 to 2 or rarely nearly 3 in. long, with a strong central nerve and a slender one on each side at some distance from it. Stipules only seen on the young shoots. Peduncles rather long. Spikes usually 4 to 5 lines long. Fruits rather large, distinctly beaked, the dorsal rib or ribs entire or rarely denticulate.—R. Br. Prod. 343; F. Muell. Fragm. viii. 217; Reichb. Ic. Fl. Germ. t. 29.

N. Australia. Albert River, *F. Mueller.*
Queensland. Rockhampton, *O'Shanesy* and others.
N. S. Wales. Williams River, *R. Browne;* Tweed River, *C. Moore;* Darling River, *Mrs. Ford.*

Common in the northern hemisphere. The typical form has the leaves very much broader than in *P. obtusifolius* and much crisped on the edges, but the narrow-leaved forms come very near to that species.

7. **P. obtusifolius,** *Mert. et Koch; Kunth, Enum.* iii. 135.—Stems

slender, terete or somewhat flattened. Leaves all submerged, alternate except under the peduncles or branches where they are opposite, narrow-linear, entire, usually 3-nerved with a very few transverse veins, obtuse or almost acute, sessile and rounded or shortly contracted at the base, mostly 1½ to 3 in. long. Stipules often persistent and at length splitting into threads, but all fallen away from some specimens. Peduncles not long. Spikes usually ½ in. or rather longer, not very dense. Nutlets about 1½ lines long, with a straight or hooked beak, often rugose, the dorsal rib and lateral angles usually obtuse and scarcely distinct but sometimes more prominent and toothed. Seed usually much curved with the upper end obliquely reflexed.—F. Muell. Fragm. viii. 216; Reichb. Ic. Fl. Germ. t. 25; *P. gramineus*, R. Br. Prod. 343; Hook. f. Fl. Tasm. ii. 42 and of some others.

N. S. Wales. Ponds near the Hawkesbury, *R. Brown*; Camden county, *Miss Atkinson*; New England, *C. Stuart*.
Victoria. Yarra and several other rivers, *F. Mueller* and others.
Tasmania. South Esk River, *Gunn*, *C. Stuart*.
S. Australia. Torrens River, *F. Mueller*.

The Linnean names *P. gramineus* and *P. compressus* have been so variously applied to this and the following species, as well as to the varieties of some of the heterophyllous species with the leaves all submerged, and the species were so vaguely defined by Linnæus himself that they cannot now be satisfactorily identified, and I have followed most modern authors in taking up the species at first correctly defined by German botanists and suppressing entirely the Linnean names.

The *P. obtusifolius* is one of the most generally spread over the area of the genus. Tuckerman defines the N. American form as having the upper curved end of the embryo (and seed) horizontal; I have found it very variable, slightly or much curved, sometimes almost coiled, usually reflexed, but I have never seen it horizontal.

8. **P. acutifolius**, *Link; Kunth*, *Enum.* iii. 135.—Very near *P. obtusifolius*, with the same habit and stipules, the stems more frequently flattened and the leaves generally very acute, with 1 prominent central nerve and very often 1 on each side, but they are not connected by transverse veins, and the very fine numerous longitudinal veins, scarcely visible in *P. obtusifolius*, are here rather more conspicuous. Spikes short and few-flowered. Nutlets smaller and more curved than in *P. obtusifolius*, and the seed almost forming a complete coil.—Reichb. Ic. Fl. Germ. t. 26; *P. compressus*, F. Muell. Fragm. viii. 216, and of many authors.

Victoria. Murray River, *F. Mueller*.

9. **P. pectinatus**, *Linn.; Kunth*, *Enum.* iii. 137.—Stems very slender, repeatedly dichotomous. Leaves all submerged, very narrow-linear, 2 to 3 in. long, 1-nerved, most of them dilated at the base into a rather long sheath, which is scarious at the edge and often projecting at the top into 2 small scarious lobes, the sheathing stipules of the other species wanting or rarely sheathing the base of the peduncle. Peduncles usually bearing several clusters of 2 or 3 flowers at some distance from each other, forming a slender interrupted spike, rarely reduced to a single terminal cluster. Nutlets of *P. obtusifolius* or rather smaller.—

Reichb. Ic. Fl. Germ. t. 19; *P. marinus*, Linn.; F. Muell. Fragm. viii. 217; Reichb. Ic. Fl. Germ. t. 18.

Victoria. Yarra and Gillibrand Rivers and Lake Colac, *F. Mueller.*
Tasmania. Derwent River, *Abbott.*
S. Australia. Holdfast Bay, St. Vincent's Gulf, *F. Mueller.*

Very generally distributed over the area of the genus, in fresh and brackish waters.

TRIBE II. ZOSTEREÆ.—Flowers hermaphrodite or unisexual. Perianth none or rudimentary or in one sex only. Carpels 1 to 3 or rarely more, 1-seeded or rarely several-seeded. Aquatic submerged plants, mostly marine or subsaline.

3. RUPPIA, Linn.

Flowers hermaphrodite, in a spike enclosed when young in the sheathing bases of the floral leaves. Perianth none. Anthers 2, each with 2 distinct cells (described sometimes as four 1-celled anthers), the cells opening outwards; pollen-grains narrow-oblong, slightly curved, with the ends somewhat dilated. Carpels 4, at first sessile, but soon protruded on long stalks, each with 1 pendulous ovule and terminating in a short style or almost sessile broad stigma. Fruiting carpels ovoid or pear-shaped, often oblique. obtuse or more or less produced into a slightly curved beak.—Subsaline aquatic plant, with slender much-branched stems and linear-filiform leaves.

The genus is limited to a single species, common in salt and brackish lagoons and marshes in most temperate or subtropical regions of the globe, varying much in the more or less slender foliage, in the beak of the fruit, etc., and divided by some botanists into several species.

1. **R. maritima,** *Linn.; Kunth, Enum.* iii. 123.—Stems and leaves submerged, filiform, the leaves often very long, the barren ones alternate, slightly dilated at the base, the floral ones crowded several together, dilated at the base into thin almost scarious sheaths closely imbricate and completely enclosing the young spike, which soon emerges on a short or long and spirally coiled peduncle bringing it to the surface of the water. Flowers 2 to about 6, sessile, at first close together, at length often distant. Anthers not ½ line long. Carpels at the time of flowering not exceeding the anthers, but immediately afterwards the anthers fall away, and the stalks of the carpels lengthen out to from ½ in. to above 1 in. Ripe carpels about 1 line long or rather more.—Hook. f. Fl. Tasm. ii. 42; F. Muell. Fragm. viii. 217; Nees, Gen. Fl. Germ.; Reichb. Ic. Fl. Germ. t. 17.

Queensland. Moreton Bay, *F. Mueller.*
Victoria. Portland Bay and other points along the coast, also Lake Calvert, where it is eaten by cattle, *F. Mueller.*
Tasmania. Abundant in the Tamar, Derwent, etc., *J. D. Hooker.*
S. Australia. Holdfast Bay, *F. Mueller.*
W. Australia, *Drummond, n.* 180, 182, 183, mixed with *Lepilæna;* Murchison River, *Oldfield.*

4. POSIDONIA, König.

(Caulinia, *DC.*)

Flowers hermaphrodite or the terminal one of each spike male or semi-abortive. Perianth none. Anthers 3, consisting of a broad almost fleshy connective, with 2 short dorsal cells at the base separated by the broad thick centre. Ovary of 1 sessile carpel, with a single erect ovule, terminating in 2, 3 or more short stigmatic lobes. Fruit indehiscent, the pericarp thick and fleshy or succulent. Seed adnate to one side of the cavity; embryo erect, straight, with a rather large plumule in a terminal grove.—Marine submerged plants, the base of the stem covered with the filamentous remains of old leaf-sheaths. Leaves often very long, breaking off transversely from the persistent sheathing base. Scape leafless below the inflorescence, bearing at the end several spikes, each in the axis of a short floral leaf, the peduncle enclosed at the base in 2 sheathing bracts, each flower subtended by a small bract and 2 bracteoles.

Besides the Australian species which appears to be endemic, there is one other limited to the Mediterranean and to the European shores of the Atlantic.

1. **P. australis,** *Hook. f. Fl. Tasm.* ii. 43.—Submerged old stems covered with longer and finer filaments than in *P. oceanica.* Leaves often 2 to 3 ft, long, 2 to 4 lines broad, rounded at the end, with rather numerous fine longitudinal veins. Scapes in the specimens seen about 1½ ft. long. Spikes 3 or 4 at short distances from each other, 2 to near 3 in. long, the lowest one pedunculate in the axil of a floral leaf longer than itself, the others sessile with shorter floral leaves, each with a pair of sheathing bracts at the base ½ to 1 in. long. Flowers 6 to 12 on each spike. Bracts and bracteoles shorter than the anthers, broadly ovate or orbicular, peltately attached and very deciduous except the attached centre which persists. Connectives ovate-lanceolate, tapering to a point (not truncate with a subulate point as in *P. oceanica*), 2½ to 3 lines long, the basal cells on the back about one fourth as long. Carpel contracted at the top, with a thick 2 to 4-lobed stigma. Fruit ovoid-lanceolate, 7 to 8 lines long, but not seen quite ripe.—Aschers. in Linnæa, xxxv. 171; *Caulinia oceanica,* R. Br. Prod. 339, not of DC.

Tasmania, *R. Brown* (not labelled in his herb.); near George Town, below low-water mark, *Gunn.*

S. Australia. St. Vincent's Gulf, *F. Mueller.*

W. Australia. King George's Sound, *F. Mueller,* and probably from the same shore, *R. Brown* (not labelled in his herb.), *Drummond.*

5. ZOSTERA, Linn.

Flowers unisexual, the males and females in alternate rows on the membranous rhachis of a spike enclosed in the sheathing base of the floral leaf. Perianth none. Male flowers of a single sessile oblong laterally attached 1-celled anther; pollen confervoid. Female flowers of a single carpel, laterally attached near the apex and produced above the attachment into a filiform 2-branched style. Ovule 1, pendulous. Fruit an indehiscent pendulous nutlet. Embryo with a deep longitudinal groove, forming 2 valves which fold over the long curved linear cotyledonous end.—Marine submerged plants with a creeping rhizome emitting short stems, with long narrow grass-like leaves separating from their narrow sheathing bases by a transverse line. Peduncles axillary or terminal, bearing a single spike completely enclosed in the slightly dilated but continuous sheathing base of the floral leaf or spatha, which otherwise resembles the stem-leaves. Rhachis of the spike broad and thin, with the margins folded inwards and bearing the flowers and fruits only on the inner surface.

The genus consists of very few species, perhaps reducible to two only, common in most seas at or near the shores. The Australian species have both been described as endemic, but one at least if not both appear to be identical with forms observable in other seas, although the common broader leaved variety of *Z. marina* has not yet turned up from Australian seas.

Floral sheaths ½ to ¾ in. long and scarcely above 1 line broad, the rhachis inside with a little transverse vertical appendage or plate over every carpel . . . . . 1. *Z. nana.*
Floral sheaths nearly 1 in. long and 2 lines broad, the rhachis inside without transverse appendages . . . . 2. *Z. tasmanica.*

1. **Z. nana,** *Roth; Kunth. Enum.* iii. 117.—Rootstock slender. Leaves narrow-linear, rarely above 1 line broad, varying in length from a few inches to 1 or 2 ft., usually truncate or notched at the end, with 1 conspicuous central nerve and 1 or 2 lateral ones on each side often scarcely apparent. Peduncles ½ to 1 in. long, the floral leaf or spatha usually rather narrower than the others, except the sheath which is ½ to ¾ in. long and above a line broad, the margins quite closed over the spike but not connected, the stigmas usually protruding at the time of flowering. Rhachis of the spike thin and membranous, lining the inside of the sheath but free from it, the margins folded inwards and bearing just within the edge on each side 2 or 3 vertical plates folded inwards over some of the flowers.—*Z. marina*, Hook. f. Fl. Tasm. ii. 44, and R. Br. Prod. 338? partly; *Z. Muelleri*, Irmisch; Aschers. in Linnæa, xxxv. 168.

Coasts of **Victoria** and **S. Australia**, *F. Mueller* and of **Tasmania** *Gunn*, *J. D. Hooker.*

The Australian form is distinguished by Ascherson and others from the *Z. nana* of the northern hemisphere, chiefly by the apex of the leaf being truncate with a very open notch in the one, and narrow with a deep narrow notch in the other, but I find differences as great in this respect between different specimens from the same seas, as between those taken from different hemispheres. Every where the species seems to vary in the number and shape of the inflected plates as well as in the foliage, but I always find these plates just within the margin of the rhachis, as drawn in Nees' Genera Fl. Germ., not strictly marginal as they are usually described.

2. **Z. tasmanica,** *G. v. Mart.; Aschers. in Linnæa,* xxxv. 168.—Foliage of the broader leaved specimens of *Z. nana*, or of the narrowest varieties of the northern *Z. marina*, the leaves rather above 1 line broad,

and rounded, not notched nor truncate, at the end. Peduncles short. Sheathing base of the floral leaf or spatha when in fruit about 1 in. long and nearly 2 lines broad, without any of the inflected plates on the rhachis of the spike at least in the single one examined, but the specimen very imperfect. This floral leaf is described as having no lamina but in the portion I have seen of the original specimen although it has generally fallen off there are still the remains of it attached to some of the spikes.—*Z. marina*, R. Br. Prod. 338?

Victoria. Port Phillip and Lady Bay, *F. Mueller.*

Tasmania. R. Brown's and some of Gunn's specimens without fructification probably belong rather to this species than to *Z. nana.* It remains to be shown whether the *Z. tasmanica* be really distinct from the narrow-leaved variety of the common *Z. marina*, Linn.

6. CYMODOCEA, Kœn.

(Amphibolis, *Agardh.*)

Flowers unisexual, solitary within sheathing bracts, but with the bracts sometimes several in a cyme. Perianth none. Male flowers of 2 sessile anthers more or less connate by their backs, with 2 parallel cells opening outwards in longitudinal slits. Female flowers of 2 distinct carpels, each tapering into a filiform style with 2 stigmatic branches or lobes; ovule 1 in each carpel, laterally attached near the top. Fruit-carpels 1-seeded, indehiscent (or at length opening in 2 valves?). Seed ovoid or oblong, testa membranous. Embryo with a short thick radicular base, grooved at the top with a slender incurved cotyledonous end.—Marine submerged plants, with a creeping rhizome rooting at the joints, the leafy stems very short or lengthened and erect. Leaves linear, narrow and long or rather broader and short, with a short sheathing base, in some species enclosed at the base in a long sheathing scale.

The genus extends over the Old World coasts of the Atlantic and Pacific as well as of the Indian and Mediterranean seas, with one West Indian species. Of the four Australian species here mentioned one only is endemic, the others, if correctly identified, have a general range in the Old World, but none of the Australian specimens I have seen show any fructification and of some of the described species the female flowers at least are entirely unknown, there is therefore much uncertainty in the generic and specific characters given, as well as in the indentification of species.

Leaves at or near the ends of rather hard stems closely marked with the annular scars of fallen leaves; no external scales.
  Leaves truncate at the end, with acute angles or teeth . . 1. *C. antarctica.*
  Leaves rounded and ciliate-serrulate at the end . . . . 2. *C. ciliata.*
Leaves narrow on short stems, the nodes or scars rather distant, enclosed at the base in a sheathing scale.
  Leaves 2 to 3 lines broad . . . . 3. *C. serrulata.*
  Leaves 1 to 1½ lines broad . . . . 4. *C. isoetifolia?*

1. **C. antarctica,** *Endl. in. Pl. Preiss.* ii. 273.—Rhizome emitting hard stems, more branched and more slender than in *C. ciliata*, but similarly marked with numerous annular scars of fallen leaves. Leaves

1 to 3 in. long, 3 to 4 lines broad, truncate at the end with the two angles more or less produced into short teeth, the smooth sheathing bases with narrow inflexed margins, and separated from the lamina by a transverse line, more or less prominent on the upper or inner surface and sometimes produced into lateral teeth. Fructification imperfectly known, only from Gaudichaud's figure.—Hook. f. Fl. Tasm. ii. 44; *Ruppia antarctica*, Labill. Pl. Nov. Holl. ii. 116. t. 264; Gaudich. in Freyc. Voy. Bot. t. 40. f. 2; *Caulinia antarctica*, R. Br. Prod. 339; *Amphibolis antarctica*, Aschers. in Linnæa, xxxv. 164; *A. zosterifolia*, Agardh; F. Muell. Fragm. iv. 113.

Victoria. Coast near Melbourne, *Adamson*.
Tasmania. Rocks in the sea near George Town, *Gunn*.
W. Australia, *Drummond*, *n.* 112, 237, 289.

2. **C. ciliata,** *Ehrenb.; Aschers. in Linnæa*, xxxv. 162, and in *Anleit. Wiss. Beob.* 363.—Rhizome emitting hard almost woody stems of 3 or 4 in. to nearly 1 ft., marked with numerous annual scars of fallen leaves and ending in a tuft of broad linear leaves, usually falcate, 3 to 6 in. long and about 4 lines broad, rounded and ciliate-serrulate at the end, contracted at the base into a short brown sheath clasping the stem all round, the margins closing at the base but not united. Fructification unknown.—*C. serrulata*, F. Muell. Fragm. viii. 218, but not of R. Br.

N. Australia. Whitsunday Islands, *Kilner*.
Queensland. Various places along the coast from Northumberland Islands to Cape Upstart, *Fitzalan*.

I have not seen the specimens from Cape York, *Daemel*, which F. Mueller l. c. distinguishes as the true *C. ciliata*, but I can find no difference whatever between Fitzalan's specimens and those from various parts of the coasts of E. India, eastern Africa, and the Red Sea.

3. **C. serrulata,** *Aschers. in Anleit. Wiss. Beob.* 362. — Leafy branches not so hard as in *C. ciliata*, and the leaves or annular scars of fallen leaves distant. Leaves broad-linear, shorter than in *C. ciliata*, varying from 2 to 3 lines long, rounded and minutely denticulate or almost entire at the end, the sheathing base rather longer than in *C. ciliata*. Fructification unknown.—*Caulinia serrulata*, R. Br. Prod. 339.

Queensland? Some specimens without fructification from Port Denison, *Fitzalan*, nearly resemble R. Brown's.
S. Coast? *R. Brown*, the specimens in his herbarium have no label.

4. **C. isoetifolia,** *Aschers. in Linnæa*, xxxv. 163?—Habit of *C. serrulata*, but the leaves much narrower and remarkable when in fructification by the sheathing bracts, rather numerous, in a dichotomous cyme, although each pair encloses only a single flower.

Queensland? Some fragmentary specimens from Edgecombe Bay, *Fitzalan*, may possibly represent this species which is known chiefly from the East Indian coasts.

7. LEPILÆNA, J. Drumm.

(Hexatheca, *Sond.*)

Flowers unisexual, usually diœcious, solitary within a pair of sheathing bracts (sometimes wanting to the central flower of a male cluster). Male flowers: Perianth very small, cupular, 3-toothed or 3-lobed, almost reduced to a slight dilatation of the pedicel. Anthers 3 or rarely 2, sessile, each with 2 cells opening outwards in longitudinal slits and all united by their backs so as to appear like a single oblong 6-celled anther. Female flowers sessile or pedicellate within the bracts. Perianth of 3 segments. Carpels 3, distinct, sessile or shortly stipitate, tapering into a short or long style with an entire oblong stigma; ovule 1 in each carpel. Fruit of 3 oblong nutlets. Seed attached near the apex, oblong-linear. Embryo straight, except the cotyledonous end more or less involute.—Submerged plants, with filiform much-branched stems and capillary leaves often minutely serrulate, dilated at the base into narrow stipular sheaths, the floral leaves nearly opposite, their sheaths more or less dilated, enclosing at least the male flowers.

The genus is exclusively Australian, inhabiting freshwater or saline marshes and lagoons. It has been by some referred to the Mediterranean genus *Althenia*, but that has certainly the single stamen in the same cluster as the female flowers and the peltate stigma of *Zannichellia* from which it is scarcely generically distinct.

Style much shorter than the carpel.	
Female flowers on pedicels soon elongated, the perianth-segments ovate, much shorter than the carpels . .	1. *L. australis.*
Style filiform longer than the carpel.	
Female flowers pedicellate above the sheath. Perianth-segments inconspicuous, nearly as long as the carpels	2. *L. cylindrocarpa.*
Female flowers on pedicels shorter than the sheaths. Perianth-segments rather longer than the carpels and very conspicuous	3. *L. Preissii.*

1. **L. australis**, *J. Drumm.; Harv. in Hook. Kew. Journ.* vii. 58.—Stems filiform, much-branched. Leaves capillary, slightly dilated and sheathing at the base. In the male plant floral leaves several together, their dilated stipular bases forming an involucre of 2 or 3 lines completely enclosing 2 or 3 flowers, each flower also enclosed in 1 or 2 very thin stipular membranous sheaths without any or with very short laminæ. Flowers shortly stipitate, the anthers sessile immediately above the minute cupular perianth. In the female plant floral leaves with narrow stipular bases, the flowers shortly pedicellate, but the pedicels soon elongating to from 3 to 6 lines or even longer. Perianth of 3 ovate segments not ½ line long. Carpels 3, oblong, tapering into a style shorter than the carpel itself with a slightly dilated oblong stigma. Fruits under 1 line long, shortly stipitate on the receptacle.

W. Australia. Swan River or King George's Sound, *Drummond*, n. 100, 179, 184, 397; Hutt River, *Oldfield*.

Tasmania? *Zannichellia palustris*, Hook, f. Fl. Tasm. ii. 43, from Arthur's Lake, *Gunn*, without flowers, and Swanport, *Story*, with male flowers, is referred by

F. Mueller to this species. The specimens are unfortunately not in a state for accurate determination. The young fruits are broader than in *L. australis* and slightly tuberculate, the styles short, but the stigmas already worn off.

2. **L. cylindrocarpa,** *Benth.*—A diœcious plant with the filiform stems and capillary leaves of *L. australis,* but the bases of the leaves scarcely dilated and the stipular sheaths of the floral leaves much narrower than in that species. Male flowers the same. Females pedicellate above the sheathing base from the first, the pedicel sometimes elongating as much as in *L. australis.* Perianth-segments narrow and thin, not exceeding the carpels and not very conspicuous. Carpels about 1 line long, rather more slender than in *L. australis,* the filiform style as long as the carpel, with an oblong stigma.—*Zannichellia cylindrocarpa,* Körnicke in Walp. Ann. vi. 3; *Hexatheca australis;* Sond. MS.; included in *Lepilæna Preissii* by F. Muell. Fragm. viii. 217.

Victoria. Saline waters at the mouth of the Yarra and near Station Peak. *F. Mueller.*

Tasmania. Near Hobarton, *Gunn.*

S. Australia. Saline Marshes, Port Adelaide, *F. Mueller.*

3. **L. Preissii,** *F. Muell. Fragm.* viii. 217, *partly.*—Stems and leaves usually still finer than in the two preceding species, the sheathing bases very narrow. Male flowers much the same. Females usually numerous along the stem, the 2 floral leaves at their base with narrow sheaths often scarious at least at the end and the filiform laminæ short. Flowers shortly pedicellate within the sheath, the pedicel rarely slightly exceeding it when in fruit. Perianth-segments rather longer than the carpels, narrow but usually striate and whitish or more or less scarious so as to be much more conspicuous than in *L. cylindrocarpa.* Fruit-carpels cylindrical, almost sessile, about 1 line long. Style filiform, longer than the carpel, with an oblong clavate stigma.—*Zannichellia Preissii,* Lehm. in Pl. Preiss. ii. 3.

Victoria. Lake Wellington and Lake Calvert, *F. Mueller.*

W. Australia, *Drummond, n.* 115, 181; Canning River, *Preiss, n.* 1879; north of Stirling Range, *F. Mueller.*

8. NAIAS, Linn.

(Caulinia, *Willd.*)

Flowers unisexual, solitary in the axils of floral leaves, sessile or shortly pedicellate. Male flower: anther single, 1- or 4-celled, enclosed in a thin membranous bract or perianth, irregularly lobed at the top and often splitting and rolling back so as to disclose the apex of the anther; pollen globular. Female flowers sessile. Perianth none besides the bract. Carpel 1, tapering into a style divided into 2, 3 or sometimes 4 stigmatic branches; ovule 1, erect. Fruit a small indehiscent oblong or cylindrical nutlet. Seed erect, with a hard testa; embryo straight, with a prominent plumula.—Submerged freshwater or subsaline herbs, with slender branching stems. Leaves linear, in pairs or clusters so as to appear opposite or verticillate, bordered by minute or prominent acute or pungent teeth, dilated at the base into a membranous sheath often produced on each side into hyaline toothed or ciliate stipular lobes.

The genus is widely spread over the temperate and some of the warmer regions of the globe. Of the two Australian species one may be endemic, the other occupies the general area of the genus.

P. Magnus, in an elaborate memoir on the anatomy of the genus (Beiträge zur Kenntniss der Gattung Naias, Berlin, 1870, with 8 plates) describes the ovary as a perianth with stigmatic lobes, and the ovule consequently as naked, and the epidermis of the anther as an inner perianth, views in which it is exceedingly difficult to concur.

Leaves prominently toothed almost pinnatifid, the basal sheath not produced into scarious stipules	1. *N. major.*
Leaves very narrow, the teeth very minute, the basal sheath produced on each side into a broadly lanceolate stipular lobe	2. *N. tenuifolia.*

1. **N. major,** *All.; Kunth, Enum.* iii. 112.—Leaves linear, bordered by broad triangular acute very prominent teeth so as to be almost pinnatifid, ½ to nearly 1 in. long, dilated at the base into a very short broad toothed sheath not different in texture from the lamina nor produced into stipular lobes, "aculeate on the back as well as the stem" but the prickles few or so minute as to be difficult to see on the dried specimens. Flowers diœcious. Male perianth oblong, consisting of a thin membranous sac entirely enclosing the anthers, 2- or 3-toothed and at length bursting irregularly at the top. Anther sessile, 4-celled. Female flower a single oblong carpel with 2 or 3 linear stigmatic lobes, the ripe nutlet about 1½ lines long.—F. Muell. Fragm. viii. 218; Nees Gen. Fl. Germ. Ic.

N. Australia. Flinders River, *F. Mueller.*
W. Australia. Murchison River, *Oldfield.*

The species is widely spread over the northern hemisphere.

2. **N. tenuifolia,** *R. Br. Prod.* 345.—Stems slender, much branched. Leaves very narrow linear, flat and transparent, mostly about 1 in. long, 1-nerved, bordered by rather numerous very minute teeth often only visible under a strong lens, the sheathing base very short but produced on each side into a rather long broadly lanceolate ciliate-toothed stipular lobe. Male flower stipitate, oblong, about ½ line long. Female carpel about 1 line long, oblong-cylindrical, produced into a filiform deeply 2-branched style as long as the carpel.—F. Muell. Fragm. viii. 219.

Queensland, *R. Brown?* Brisbane River, *F. Mueller.*
N. S. Wales. Port Jackson, *R. Brown;* Hunter's River, *Leichhardt;* Nepean River, *Woolls.*
Victoria. Murray River, *F. Mueller.*

I have not seen Brown's specimens and give his stations from his Prodromus.

The species is reduced by A. Braun in Seem. Journ. Bot. 1864, 278, to a variety of *N. graminea*, Del. (from N. Africa, E. India, and the Malayan Archipelago), relying chiefly on the form of the stipular lobes of the leaf-sheaths. If the two species are really identical it is Brown's name that should be adopted as being by far the older one. Magnus, however, Nuov. Giorn. Bot. Ital. ii. 189, describes the anther of *N. graminea* as 4-locular, and according to Brown that of *N. tenuifolia* is 1-locular. I have only been able to find a single male flower in the Australian specimens before me, and that was too much pressed for examination; it remains to be ascertained whether the difference is real, or is only a different mode of describing the same anther.

9. HALOPHILA, Thou.

Flowers unisexual, solitary within a pair of herbaceous bracts. Male flower: Perianth of 3 segments. Anthers 3, sessile, alternating with the segments, erect, 2-celled, the cells opening outwards; pollen confervoid. Female flowers: Perianth none. Ovary single, tapering into a filiform style with a short stigma either entire or divided into 3 to 5 filiform segments. Ovules several, erect, attached to the sides of the cavity. Fruit membranous, opening irregularly. Seeds nearly globular, with a thin testa, rather loose. Embryo erect with a thick radicular base nearly the shape of the seed, with a distinct plumula and an involute or spiral cotyledonous end both nearly immersed in a terminal groove.—Submerged marine herbs. Leaves in pairs apparently opposite, sessile or petiolate, the petioles frequently enclosed at the base in 2 broad scarious white or hyaline scales. Floral bracts axillary, sessile or the males pedicellate.

The genus is confined to the Indian and West Pacific Oceans and Mediterannean sea. Of the two Australian species one is widely dispersed over the shores of the Indian and Pacific Oceans, the other, as far as is known, is endemic.

Leaves on long petioles with an ovate or oblong entire lamina	1. *H. ovalis.*
Leaves sessile or nearly so, broadly linear, rounded and ciliate-toothed at the end	2. *H. spinulosa.*

1. **H. ovalis,** *Hook. f. Fl. Tasm.* ii. 45.—Stems creeping and rooting under water, emitting at each node 2 broad thin colourless hyaline scales 2 or 3 lines diameter and within them a pair of leaves with long slender petioles and a herbaceous lamina varying from oval and under ½ in. long to oblong-elliptical and 2 to 2½ in. long, very thin, penniveined with a broad central nerve and very fine oblique lateral veins, the margin quite entire. Involucres or double spathas enclosing the flowers ovate, sessile within the scales. Male flowers on pedicels emerging from the involucre, females sessile within it.—Aschers. in Nuov. Giorn. Bot. Ital. iii. 301; *Caulinia ovalis*, R. Br. Prod. 339; *Halophila ovata*, Gaudich. in Freyc. Voy. Bot. t. 40, f. 1; F. Muell. Fragm. viii. 219; *Diplanthera*, Griff. Ic. Pl. Asiat. t. 161, C. f. 2, and other synonyms quoted by Aschers. in Linnæa, xxxv. 178.

Queensland, Brisbane River, Moreton Bay, *F. Mueller;* Port Denison, *Fitzalan;* Cape York, *Moseley.*

N. S. Wales. Paramatta River, *Woolls;* Lord Howe's Island, *Lind and Fullagar.*

Victoria. Port Phillip and Queenscliffe, *F. Mueller.*
Tasmania. Bass's Straits, *Gunn.*
S. Australia. M'Donnell's Bay, *Mrs. Wehl;* St. Vincent's Gulf, *F. Mueller.*

The species is common on the shores of the Indian and Pacific Oceans, often above low-water mark at the mouths of large rivers, or brought up from depths of seven fathoms or more. All the Australian specimens I have seen are without fructification.

2. **H. spinulosa,** *Benth.*—Stems slender, submerged, with simple branches of 3 to 6 in. in the specimens seen. Leaves opposite, distichous sessile, broadly linear or almost spathulate, rounded at the end and bordered by small acute teeth or cilia, ½ to ¾ in. long and about 2 to 2½ lines broad, 3-nerved, without any scales or sheathing stipules at the base, but the margin on the lower side dilated into a semi-oval appendage folded over the lamina. Male flowers unknown. Females within a pair of small herbaceous bracts sessile in the axils, in fruit in the only specimen seen, the capsules solitary, ovate, about 2 or 2½ lines long, apparently bursting irregularly. Seeds several, rather more than ¼ line diameter, closely resembling those figured by Gaudichaud of *H. ovalis.* Embryo almost globular, the plumula and the narrow cotyledonous end curved over it, both enclosed in a cavity at the top of the embryo.—*Caulinia spinulosa*, R. Br. Prod. 339.

Queensland. Port Denison, *Kilner;* coral reefs, Albany Island, *F. Mueller;* tropical Australia, *R. Brown;* Cape York, *Moseley.*

The specimens in Brown's herbarium have no label indicating their station. They have no fructification, but Kilner's specimen in F. Mueller's herbarium in fruit is in other respects precisely similar. The species is certainly very different from *H. stipulacea* to which Ascherson (Linnæa, xxxv. 172) thought it might belong from Brown's short diagnosis. F. Mueller, Fragm. viii. 219, proposes it as a new genus under the name of *Aschersonia*, but that name is preoccupied in Fungi, and the fruit and seeds of our plant agree so well with those of *Halophila*, that it does not seem worth while to separate it generically on account of the foliage which is far from uniform in what are admitted as true species of *Halophila.*

ORDER CXXXIX. ALISMACEÆ.

Flowers hermaphrodite or unisexual, regular. Perianth when perfect of 6 segments, imbricate in 2 series, the 3 outer ones membranous or herbaceous, the 3 inner larger and petal-like, often very fugacious, and in some genera only 2 segments present, 1 on each side. Stamens 6, 9 or indefinite, hypogynous or slightly connected with the base of the segments, but when isomerous with them not usually opposite their centres; filaments filiform or flattened; anthers erect, with 2 parallel cells opening laterally in longitudinal slits. Ovary of 3, 6 or many carpels, quite distinct or shortly connate, each tapering into a short style or with a sessile terminal stigma; ovules 1, 2 or few, erect from the base of the cavity, or the funicle of the inner one shortly adnate to the inner angle, or numerous and parietal. In fruit the carpels ripen into indehiscent nutlets, or when several-seeded are variously dehiscent. Seeds erect or when several ascending or spreading, with a thin testa and inner membrane; no albumen. Embryo either straight and of the shape of the seed, or more frequently horse-shoe shaped; radicle inferior.—Marsh or water plants. Leaves radical on long petioles. Flowering stems leafless, or rarely, in species not Australian, leafy. Flowers in terminal umbels racemes panicles or simple or once forked spikes.

The Order is represented in the marshes, ponds, and shallow waters of most parts of the globe. Of the four Australian genera, two are cosmopolitan, the two others extend over tropical Asia and Africa, one of them also in South Africa.

Perianth perfect. Flowers pedicellate, paniculate, umbellate or almost racemose.
  Carpels 1-seeded, indehiscent, scarcely beaked . . . . 1. ALISMA.
  Carpels 2-seeded, tapering into divaricate beaks falling off by a transverse rupture near the base . . . . . . 2. DAMASONIUM.
  Carpels many-seeded, dehiscent along the inner suture . . 3. BUTOMOPSIS.
Perianth reduced to 2 petal-like or very small segments.
  Flowers sessile in a simple or once forked spike . . . . 4. APONOGETON.

There is also in Herb. F. Mueller a single flower with one leaf of a plant gathered by Hartmann in South Queensland, which appears to be a species of *Hydrocleis* or *Limnocharis*, with the inner perianth 3 in. diameter, closely resembling that of *L.* (*or H.*) *Humboldtii*, Rich., a South American plant. The peduncle is enclosed in longer bracts than usual in that plant and the outer perianth segments are longer and narrower, but the specimen is insufficient to show whether it is really distinct, and it may be only accidentally introduced from South America.

1. ALISMA, Linn.

Flowers usually hermaphrodite. Perianth of 6 segments, 3 outer ones membranous or almost herbaceous, 3 inner large and petal-like. Stamens 6. Ovules solitary in each carpel. Fruit-carpels indehiscent, either about 6 or numerous, arranged in a ring round the depressed axis, or (in species not Australian separated by some into a distinct genus) irregularly crowded in a globular head. Seed ovate or oblong, with a horse-shoe embryo.—Aquatic herbs, erect or in species not Australian floating, with radical leaves on long petioles. Flowers either in a terminal umbel with or without whorls of pedicellate flowers below it, or in a panicle with whorled branches, each bearing a similar umbel.

The genus is widely spread over the temperate and warm regions of the globe. Of the four Australian species one is cosmopolitan, two others are common to tropical Asia, the fourth is endemic. They have all four tall leafless loosely paniculate flowering stems, and the long petioles of the radical leaves often appear jointed from transverse partitions of thickened pith, but this character does not appear to be constant in any one species.

Carpels 15 to 30, in a flat ring. Transverse veinlets of the leaf very oblique . . . . 1. *A. plantago.*
Carpels 6 or fewer, rarely 7 or 8.
  Leaves deeply cordate with a narrow sinus, the outer primary veins on each side confluent in the auricles, transverse veinlets not very close and more or less connected by reticulations.

Carpels about 3 lines long, hard, often muricate . . 2. *A. acanthocarpum.*
Carpels under 2 lines long, smooth or tuberculate, the pericarp not very hard . . . . 3. *A. oligococcum.*
Leaves broadly cordate or reniform, the primary veins all distinct, transverse veinlets very numerous and closely parallel. Carpels somewhat drupaceous . 4. *A. reniforme.*

1. **A. plantago,** *Linn.; Kunth, Enum.* iii. 148.—Rootstock perennial, sometimes very hard and almost bulbous with the thickened sheathing bases of the petioles. Leaves ovate oblong or elliptical, shortly acuminate, 3 to 4 in. long in well-grown specimens, usually 7-nerved, the transverse veinlets very oblique, not close and more or less connected by reticulations. Flowering stem 1 to 4 ft. high, with a large loose panicle often above 1 ft. long, with whorled divaricate branches and pedicels. Outer perianth-segments ovate, striate, persistent, about 1 line long; inner ones twice as large, of a pale pink, very fugacious. Carpels 15 to 30, obovate, laterally flattened, 1 to 1¼ lines long, bearing the remains of the style on the inner edge below the apex, and marked on the back with an impressed or slightly prominent dorsal nerve, the whole forming a flat ring of 2½ to 3 lines diameter with a depressed centre.—R. Br. Prod. 342; Red. Lil. t. 452; Nees, Gen. Fl. Germ.; Reichb. Ic. Fl. Germ. t. 57.

N. S. Wales. Port Jackson, *R. Brown, Woolls.*
Victoria. Goulburn River, *F. Mueller.*

The species is generally spread over the area of the genus, especially in the northern hemisphere.

2. **A. acanthocarpum,** *F. Muell. Fragm.* i. 23, viii. 214.—Leaves broadly ovate or orbicular, deeply cordate with a narrow sinus and angular auricles, glandular-dotted, with 11 to 17 primary nerves, the outer ones on each side confluent within the margin of the auricles, the transverse veinlets not very close and often connected by reticulalations. Panicle not so loose and broader than in *A. plantago*, usually 6 to 9 in. long and broad, the branches and pedicels 3 or 4 in each whorl, the bracts under the whorls more herbaceous than in any other species, the lowest often above 1 in. long and shortly connate at the base. Flowers of *A. plantago.* Fruit-carpels usually 6 or fewer but sometimes 7 or 8, the largest of the genus, being about 3 lines long when ripe, the pericarp hard and rather thick, with 3 or 4 dorsal ribs more or less muricate, 2 or more of the prickles often conical and very prominent.

N. Australia. Lower Victoria River, *F. Mueller;* Gulf of Carpentaria, *Gulliver.*
Queensland. Rockingham Bay, *Dallachy;* Mount Elliott, *Fitzalan.*

3. **A. oligococcum,** *F. Muell. Fragm.* i. 23, viii. 214.—Closely allied to *A. acanthocarpum.* Leaves the same, with the same narrow basal sinus glandular dots and almost pedate venation. Flowers also similar, in a broad panicle with the lower bracts leafy, but smaller or

more slender than in that species. Carpels usually only 2 or 3 perfect 1½ or rarely 2 lines long, very obtuse, the 3 or 4 prominent dorsal ribs smooth or tuberculate but not muricate.—*A. glandulosum*, Thw. Enum. Pl. Zeyl. 332.

N. Australia. Upper Victoria River, *F. Mueller*; Port Darwin, *Schultz*.
Queensland. Moreton Bay, *Hill and F. Mueller*; Herbert's Creek and Gainsford, *Bowman*; Rockingham Bay, *Dallachy*.

Also in Ceylon and East India. This and the preceding species may prove to be varieties of a single one. The *A. oligococcum* varies much in stature, some of the Rockingham Bay specimens are not 6 in. high, with small leaves. The larger specimens have loose panicles of about 1 ft. and rather large leaves, sometimes very thin.

4. **A. reniforme,** *Don, Prod. Fl. Nep.* 22.—Leaves orbicular-cordate or reniform, 1½ to 4 in. long and often broader than long, very obtuse, with 13 to 17, usually 15 primary nerves, the transverse veinlets very numerous fine and closely parallel. Panicle very large, with long verticillate branches not numerous in each whorl. Outer perianth-segments nearly orbicular, many-nerved, about 2 lines long. Carpels 6 or fewer, rarely 7 or 8, thick and more or less drupaceous, with several usually 7 or 9 dorsal ribs not tuberculate, the style rather slender, adnate to the inner edge to near the summit.—Wight, Ic. t. 322.

Queensland. Burnett River, *F. Mueller*; Rockhampton, *O'Shanesy*; Rockingham Bay, *Dallachy*.

The species is also common in many parts of East India. F. Mueller, Fragm. viii. 214, refers this to the European *A. parnassifolium*, Linn. and Micheli, who has been studying the order with great care, thinks it may be a variety only, but the broad almost retuse shape of the leaf, its numerous primary nerves and the generally large habit, together with the great geographical separation, may justify the retaining it as a distinct species.

2. DAMASONIUM, Juss.

(Actinocarpus, *R. Br.*)

Flowers hermaphrodite. Perianth of 6 segments, 3 outer ones membranous, 3 inner larger and petal-like and very fugacious. Stamens 6. Ovules 2 in each carpel. Fruit carpels 6 to 9 or rarely more, laterally flattened, adnate by their broad base to the convex or conical receptacle, tapering into a beak, spreading, when ripe usually breaking off transversely near the base. Seeds 2 or solitary by abortion. Embryo horse-shoe shaped.—Aquatic or marsh herbs, with the habit of the annual *Alismas*.

Besides the Australian species which is endemic, the genus comprises two others from the northern hemisphere, all three closely allied to each other and possibly varieties of one.

1. **D. australe,** *Salisb.*; *Kunth, Enum.* iii. 155.—A tufted glabrous annual. Leaves all radical, on long petioles, from ovate-cordate to lanceolate, 1 to 2 in. long, with 3 or 5 primary nerves connected by several rather distant transverse veins, and these again by numerous

cross parallel veinlets. Stems leafless, 6 in. to 1 ft. high, flowering from about the middle, with verticillate branches either all 1-flowered and ½ to 1 in. long, or some of them elongated bearing an umbel of 5 to 10 flowers. Outer perianth-segments scarcely above ⅓ line long; inner ones rather larger but exceedingly fugacious. Carpels usually about 9, but varying from 5 to 10, breaking off when ripe by a transverse somewhat curved line, usually dropping the lower seed and carrying off the upper one with it. Seeds oblong, tuberculate.—F. Muell. Fragm. viii. 215; *Actinocarpus minor*, R. Br. Prod. 343; *Alisma minus*, Spreng. Syst. ii. 163.

Queensland. Herbert's Creek, *Bowman*; Armidale, *Parrott*; North Queensland, *Armit*.

N. S. Wales. Cow-pastures, Port Jackson, *R. Brown*.

Victoria. Yarra, Murray, and Avoca Rivers, *F. Mueller*.

W. Australia, *Drummond*, *n.* 99.

3. BUTOMOPSIS, Kunth.

(Tænagocharis, *Hochst.*)

Flowers hermaphrodite. Perianth of 6 segments, 3 outer ones thinly membranous, reticulate, 3 inner rather larger, petal-like but very thin and transparent, fugacious. Stamens 8 or 9. Ovules numerous in each carpel. Fruit-carpels 6 or sometimes 7, slightly cohering at the base, and adnate to the flat receptacle, tapering into short spreading beaks, opening along the ventral suture. Seeds very numerous. Embryo horse-shoe shaped.—Semi-aquatic or marsh plant, with radical leaves on long petioles. Flowers on long pedicels, in a simple terminal umbel.

The genus is limited to a single species spread over tropical Asia and Africa. It has the polyspermous carpels of *Butomus*, with the embryo of *Alisma*. Kunth's and Hochstetter's names appear to have been published contemporaneously. I have preferred the former not only as having been published in a general work but as being accompanied by a much more accurate character with a reference to known species overlooked by Hochstetter. The whole genus is however perhaps not sufficiently distinct from the American *Limnocharis*.

1. **B. lanceolata**, *Kunth*, *Enum.* iii. 165.—Leaves oblong-lanceolate or elliptical, acute or obtuse, usually attaining the length of the scape including their long petiole. Scape 4 to 8 in. high under the umbel, which consists of from 3 to above 20 pedicels 1½ to 4 in. long when in fruit, surrounded by a few thin scarious bracts. Outer perianth-segments ovate or nearly orbicular, 2 to 2½ lines diameter when in flower, persistent and sometimes rather larger under the fruit; inner segments rather larger and very deciduous. Ripe carpels shortly exceeding the perianth. Seeds smooth and shining, scarcely more than ¼ line long.—*Butomus lanceolatus*. Roxb. Fl. Ind. ii. 315; Royle, Illustr. Him. Bot. t. 95; *Tænagocharis cordofana*, Hochst. in. Flora, 1841, 369; F. Muell. Fragm. x. 104.

N. Australia. Lagoons on Gilbert River, *Armit*.

4. APONOGETON, Thunb.

Flowers hermaphrodite. Perianth of 2 segments one on each side. small or in species not Australian petal-like. Stamens usually 6. Carpels of the ovary usually 3, with 2 to 6 ovules in each carpel all erect from the base. Seeds ovoid or oblong, erect. Embryo straight, with a more or less prominent plumula in a groove on the inner face.—Aquatic herbs with erect or floating or submerged leaves usually oblong or narrow. Scapes leafless except a very deciduous membranous bract or spatha enclosing the young spike, but almost always fallen away before the flowering, leaving an annular scar. Flowers sessile in a terminal spike, simple in the Australian species but divided into two in some African and Asiatic ones.

The genus extends over tropical Asia and tropical and southern Africa. Of the two Australian species one is a common Indian one, the other appears to be endemic. The specific characters derived from the bulb-shaped rhizome may not be constant, having been observed only in a very few dried specimens to which the roots remain attached.

Bulb-shaped rootstock covered with filamentous remains of leaf-sheaths and emitting roots from the base. Leaves under 6 in. long. Fruit-carpels tapering into a short recurved style . . . . 1. *A. monostachyus.*

Bulb-shaped rootstock without filaments, emitting fibrous roots from the apex. Leaves above 6 in. long. Fruit-carpels obtuse with the rudimentary style almost lateral . . . . 2. *A. elongatus.*

1. **A. monostachyus,** *Linn. f. Suppl.* 214.—Rootstock thickened into a hard woody bulb-shaped tuber, covered with filamentous remains of old leaf-sheaths and emitting fibrous roots from the base or lower half. Leaves mostly submerged, oblong or lanceolate, obtuse or almost acuminate, cordate or rounded at the base, mostly 3 to 4 in. long and ½ to ¾ in. broad, with 5, 7 or rarely only 3 longitudinal nerves. Spikes simple, usually dense, 2 to 2½ in. long, rarely longer more slender and interrupted. Spatha 2 or 3 lines long, falling off before the first flower expands. Perianth-segments from broadly lanceolate to obovate, membranous, about ¾ line long. Stamens shortly exceeding the perianth. Fruiting carpels ovoid, tapering into a short recurved beak. Seeds 2 to 6, erect, narrow-oblong, the outer membrane loose and almost hyaline, the inner more opaque darker coloured and closely appressed to the embryo.—Thunb. Nov. Gen. Pl. 73, with a figure; Roxb. Corom. Pl. t. 81; Andr. Bot. Rep. t. 406; *Spathium monostachyum*, Edgew. in Calcutta Journ. iii. 533, t. 16, corrected to *Aponogeton monostachyus* in Hook. Lond. Journ. iii. 404, t. 17.

N. Australia. Gilbert River, *Gulliver.*

Queensland. Rockhampton, *Thozet, O'Shanesy;* Burdekin River, Herbert's Creek and Gainsford, *Bowman.* The species is widely spread over tropical Asia.

2. **A. elongatus,** *F. Muell. in Herb. Hook.*—Tuberous rootstock formed below the uppermost fibrous roots and without the filamentous

covering of *A. monostachyus* (at least in the specimens seen). Leaves submerged, very tender, from 6 in. to above 1 ft. long, and ⅓ to 1½ in. broad, contracted at the base or very rarely produced on one or both sides into a short basal auricle, with 5, 7 or 9 longitudinal nerves. Spikes simple as in *A. monostachyus* but more slender and the flowers not so close. Perianth and stamens as in that species. Carpels of the ovary very short with scarcely prominent styles and in fruit they are ovoid-globular, 2 to 3 lines long, very obtuse, with the very short remains of the style almost lateral. Seeds usually 3 or 4 in each carpel, narrow oblong, the outer membrane not striate, the inner one exceedingly delicate. Embryo with a narrow groove, the small plumula at the base of the groove below the middle of the embryo.

N. Australia. Roper and Van Alphen Rivers, *F. Mueller.*

Queensland. Brisbane River, *F. Mueller ; Bailey.*

N. S. Wales. Richmond River, *Fawcett ;* Clarence River, *Wilcox* (the latter without fructification and the leaves all reduced to long petioles, but probably a state of the same species).

This species is referred by F. Mueller, Fragm. viii. 216, to *A. crispus*, Thunb. or *A. undulatus*, Roxb., which however has the carpels shortly rostrate except when deformed by insects, and ripens only one or rarely two seeds in each carpel, and these seeds are of an ovoid shape with a broad open groove to the embryo.

ORDER CXL. ERIOCAULEÆ.

Flowers unisexual, in androgynous or rarely diœcious heads, with imbricate scarious dry or rarely herbaceous bracts, 1 under each flower, and usually a few outer ones empty. Perianth normally of 6 or 4 hyaline or scarious small segments in 2 rows, the inner ones immediately under the stamens or ovary, the outer ones lower down on the stipes or receptacle, but occasionally reduced in numbers, or those of one row more or less united, especially in the males. Stamens as many as the inner segments of the perianth and opposite to them or twice that number ; filaments short ; anthers small, 2-celled, the cells opening in longitudinal slits. Ovary of 3 or 2 lobes and cells, with 1 pendulous ovule in each cell ; style single, with 3 or 2 filiform stigmatic branches. Capsules slightly enlarged from the ovary and of the same shape, the lobes opening dorsally in 2 valves. Seeds solitary in each cell, globular or ovoid, usually striate or minutely tuberculate. Albumen mealy. Embryo small, obovoid or lenticular, remote from the hilum.—Herbs mostly marsh or aquatic, either tufted with radical leaves or the stems more or less elongated and covered with old leaves, the upper ones forming a terminal tuft. Leaves linear or filiform, rarely lanceolate. Scapes radical or peduncles terminal or in the upper axils, simple and leafless, but each one usually enclosed at the base in a sheathing scale, and bearing a single terminal head. Flowers very small, usually numerous in the head, the outer rows mostly female, the inner ones chiefly male, but the two sexes often variously intermixed, all concealed within the imbricate bracts, the tips of the stigmatic branches and sometimes the anthers slightly protruding, the receptacle often hairy.

The Order is limited in the Old World to the single genus *Eriocaulon*, but there are a few other genera, and one a very large one exclusively American and chiefly tropical.

1. ERIOCAULON, Linn.

Male flowers: Inner perianth at the apex of a slightly thickened stalk, of 3 or 2 teeth or short distinct hyaline segments often fringed or ciliate and usually bearing on their inner face a small dark gland, the segments occasionally very minute or obsolete; outer perianth affixed lower down on the stalk, of 2 or 3 segments either distinct or variously united. Stamens 6 or 4, of which 3 or 2 opposite the inner segments and as many alternating with them or occasionally fewer by abortion. Rudiments of the ovary either 3 glands in the centre of the flower or rarely deficient. Female flower: inner perianth at the apex of a slender stalk (sometimes very short or scarcely any) of 3 or 2 hyaline segments usually erect and sometimes with a small gland on the inner face; outer of 2 or 3 variously shaped segments affixed lower down on the stalk, or sometimes one or both perianth deficient. Ovary 3- or 2-lobed; style branches 3 or 2, without the alternate appendages of *Pæpalanthus*.—Annuals or perennials with the leaves in radical tufts or rarely crowded on an elongated stem. Scapes or peduncles usually longer than the leaves.

The genus extends over the general area of the Order, but chiefly in the Old World, where it is the only one of the Order. Of the nineteen Australian species. four extend into tropical Asia, the remaining fifteen, as far as hitherto ascertained, appear to be endemic, some of them however require further study from more perfect specimens.

Series I.—*Flowers 3-merous or rarely partially 2-merous by abortion, especially the females.*

Submerged stems elongated, densely covered with filiform leaves. Flower-heads pubescent, at least at first . . . . 1. *E. setaceum.*

Scapes and radical leaves above 1 ft. long, loosely hairy towards the base. Flower-heads pubescent. Outer perianth-segments winged . . . . 2. *E. australe.*

Scapes and radical leaves under 6 in. and often much less, glabrous.

Flower-heads pubescent. Bracts with their tips incurved and appressed. Outer perianth-segments not winged.

Flowering bracts spathulate, acuminate, the exposed part white with the dorsal pubescence . 3. *E. quinquangulare.*

Flowering bracts broad, very obtuse, fringed only with very short hairs . . . . 4. *E. Smithii.*

Flower-heads glabrous. Bracts with their tips incurved and appressed.

Outer ♀ per. segments, linear, 3 or fewer or none.

Outer ♂ per. segments united in a spatha-like scale.

Outer ♀ per. segments linear, dilated, inner narrow erect . . . . 5. *E. nanum.*
Outer ♀ per. segments very narrow, inner none 6. *E. cinereum.*
Outer ♂ per. segments linear or oblong-spathulate, free or nearly so.
Outer and inner ♀ per. segments linear.
Plant not ½ in. high, with small leaves . . . 7. *E. pusillum.*
Plant of 1–1½ in., with rather broad linear leaves . . . . 8. *E. pallidum.*
Outer ♀ per. segments linear, inner none . . . 9. *E. nigricans.*
No ♀ per. segments, outer or inner . . . . . 10. *E. australasicum.*
Outer ♀ per. segments 2, complicate and winged.
Inner ♀ per. segments 3, oblong. Ovary 3-merous . . . . 11. *E. lividum.*
Inner ♀ per. segments 2, linear-oblong. Ovary 2-merous . . . . 12. *E. concretum.*
Flower-heads glabrous. Bracts with spreading tips.
Bracts pale-coloured, obtuse or obtusely acuminate. ♀ perianth-segments 6, nearly similar . . . . 13. *E. Schultzii.*
Bracts dark-coloured, cuneate with a rigid spreading point. Receptacle villous . . . . 14. *E. tortuosum.*

SERIES II.—*Flowers all 2-merous.*

Outer ♀ perianth-segments linear or spathulate, very deciduous, not winged.
Scapes filiform, 2 to 4 in. high. Leaves very narrow, fine pointed. Heads 1 to 1½ lines diameter . . 15. *E. monoscapum.*
Scapes 4 to 6 in. high. Leaves broadly linear, many-nerved. Heads near 3 lines diameter . . . . 16. *E. spectabile.*
Outer ♀ perianth-segments complicated with a broad dorsal wing.
Heads at length globular, with the outer bracts reflexed and empty. All the ♀ flowers with outer perianths.
Leaves mostly less than half as long as the scapes. Outer ♂ perianth-segments broadly linear . 17. *E. scariosum.*
Leaves more than half as long as the scape. Outer ♂ perianth segments very narrow . . . . . 18. *E. fistulosum.*
Heads broad. Outer bracts rigid, all flowering. Inner ♀ flowers without outer perianths.
Scapes 2 to 4 in. high. Heads pale-coloured . . 19. *E. depressum.*
Scapes 1 to 2 in. high. Heads nearly black . . . 20. *E. deustum.*

1. **E. setaceum,** *Linn.; Kunth, Enum.* iii. 550.—An aquatic plant with submerged floating stems lengthening out to 1 ft. or more, covered with linear-filiform almost capillary leaves of 1 to 2 in. Peduncles or scapes from amongst the upper leaves 2 to 3 in. long, or in very luxuriant specimens twice as long. Flower-heads depressed or at length nearly globular, rarely attaining more than 2 lines diameter and usually smaller, white with the mealy pubescence of the bracts, becoming dark coloured as it wears off. Bracts broad, the outer empty ones in 1 or 2 rows. Male flowers: 3 outer segments obovate-oblong, slightly fringed at the apex, connate into a lateral scale or at length separate; 3 inner short, usually fringed, with a small gland. Stamens 6. Female flowers: 3 outer segments at the base of the stipes nearly

equal, obovate-spathulate, concave, slightly fringed; 3 inner under the ovary linear, erect. Ovary 3-merous.

N. Australia. Near M'Adam Range, *F. Mueller;* Port Darwin, *Schultz*, *n.* 75, 369.

The species is common in E. India and the Malayan Archipelago. The Australian specimens all belong to the species as restricted by Kœrnicke, Linnæa, xxvii. 603, with the bracts and perianth-segments white-pubescent at the apex. The *E. intermedium*, Kœrn. l. c. 601, with glabrous black heads, reunited by Thwaites with the *E. setaceum*, has not yet been observed in Australia.

2. **E. australe,** *R. Br. Prod.* 254.—The largest of the Australian species, with the habit of the E. Indian *E. Wallichianum*, but differing in the more depressed flower-heads and in the structure of the parts. Scapes and leaves usually 1 to 1½ feet high, sprinkled below the middle with long loose hair, the leaves grass-like, flat or concave, varying in breadth from 1 to 3 lines. Flower-heads depressed-globular or at length nearly as long as broad, attaining 3 to 4 lines diameter, white with the mealy indumentum of the bracts which rarely wear off in the old heads. Bracts closely imbricate, broadly obovate-orbicular, a few outer empty ones glabrous and shorter than the others. Flowers in some heads mostly males, in others the females more numerous. Outer perianth-segments in both sexes complicate, more or less connate, especially in the males, the dorsal keel broadly winged; third segment very narrow in the males, oblong-lanceolate and concave in the females. Inner segments linear and slightly fringed, short in the males, longer in the females. Stamens 6. Ovary 3-merous.

Queensland. Wide Bay, *Bidwill;* Rockingham Bay, *Dallachy.*
N. S. Wales. Port Jackson, *R. Brown;* Richmond River, *C. Moore, Fawcett.*

3. **E. quinquangulare,** *Linn.; Kunth, Enum.* iii. 556.—Scapes rather slender, usually about 6 in. but varying taller or shorter. Leaves rather broadly linear, less tapering at the end than in most broad-leaved species, 1 to 2 in. long. Flower-heads at first slightly depressed, but soon globular and at length rather elongated, 2½ to 3 lines diameter, white with the short white hairs of the bracts which conceal their darker colour. Outer empty bracts short, ovate, scarious, soon reflexed and almost concealed by the flowering ones, which are more or less spathulate and shortly acuminate. Male flowers: 3 outer perianth-segments equal, spathulate, hairy at the tips like the bracts; 3 inner segments very small and fringed. Stamens 6. Female flowers: 3 outer segments linear-spathulate, dark, hairy at the tips, incurved and nearly equal; 3 inner narrow-linear, erect, fringed, with a small gland as in the males. Ovary 3-merous.—Kœrn. in Linnæa, xxvii. 641.

N. Australia. Keckwick's Springs, Arnhem's Land, *Herb. F. Mueller* (collector not named). A single specimen agreeing very well with several from East India where this species is widely spread.

4. **E. Smithii,** *R. Br. Prod.* 254.—Very closely allied to *E. quinquangulare*, differing chiefly in the pubescence of the flower-heads.

Scapes slender, 3 to 5 in. long. Leaves linear or linear-lanceolate, usually about 1 in. long. Flower-heads soon globose; outer bracts ovate, glabrous, at first very conspicuous but almost concealed under the old heads; flowering bracts thin, obovate, scarcely acuminate, glabrous on the back but the broad margins ciliate with short hairs. Male flower: outer perianth-segments 3, oblong-linear, contracted at the base and more or less connate at first, slightly hairy at the tips; inner segments small, fringed. Stamens 6. Female flower: outer segments dark-coloured, oblong-spathulate, concave, incurved, one of them often deficient; inner segments erect, linear-oblong, fringed and hairy at the end with a small gland as in the males. Ovary 3-merous.

Queensland. Moreton Bay, *F. Mueller;* Cape River, *Bowman;* Springsure, *Wuth.*

N. S Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls*, and many others; Hastings River, *Beckler.*

Victoria. Upper Murray River, *F. Mueller.*

5. **E. nanum,** *R. Br. Prod.* 254.—Scapes in the specimens seen ½ to ¾ in. high and the leaves mostly under ½ in., linear but not very fine. Flower-heads 1 to 1¼ lines diameter, glabrous. Bracts scarious, oblong or ovate-oblong, the outer empty ones obtuse and pale-coloured, the flowering ones rather more acute and darker. Male flower: outer perianth-segments united in a broad dark spatha-like scale open on one side and shortly 3-toothed; inner segments scarcely prominent. Stamens 6. Female flower: 2 or 3 outer segments linear or lanceolate and concave, dark, dilated in the middle; 3 inner narrow-linear, but unequal, erect, denticulate, with a small gland. Ovary 3-merous.

Queensland. Facing Island, Shoalwater Bay, *R. Brown;* Brisbane River, *Bailey.*

6. **E. cinereum,** *R. Br. Prod.* 254.—Scapes filiform, attaining in the larger specimens 3 to 5 in. but sometimes not above 1 to 1½ in. Leaves radical, linear-filiform, from under ½ in. to nearly 2 in. Flower-heads hemispherical, about 1 line diameter when first out, but attaining 1½ lines when in fruit. Bracts thinly scarious, glabrous, a few outer empty ones obovate or oblong and obtuse, the flowering ones broadly lanceolate, acute or acuminate with appressed tips, contracted at the base. Male flower: Outer perianth united in an orbicular concave unilateral 3-toothed or 3-lobed scale, sometimes darker-coloured than the rest of the head and enclosing the rest of the flower; inner segments small, lanceolate, fringed, with small glands. Stamens usually 3, rarely 4 or 5; anthers pale-coloured. Female flower: Stipes rather long, with 3 linear almost capillary segments a little below the ovary, the inner segments deficient. Ovary 2- or 3-celled.—*E. heteranthum*, Benth. Fl. Hongk. 382; *E. ciliiflorum*, F. Muell. Fragm. i. 95.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* South Goulburn Island, *A. Cunningham;* Victoria River, *F. Mueller;* Port Darwin, *Schultz, n.* 368.

The species extends to South China, and will probably be found in various parts of the Malayan Archipelago and perhaps in East India. It is nearly allied to the common *E. sexangulare*, but may be readily distinguished by the male flowers with fringed inner perianth-segments and usually only 3 stamens.

7. **E. pusillum,** *R. Br. Prod.* 254.—The smallest of the known species of the genus, the scapes scarcely ¼ in. high, the loose sheathing scales more than half as long. Leaves unknown. Flower-heads scarcely 1 line diameter. Bracts scarious, glabrous or very slightly ciliate at the end, a few outer ones empty, the flowering ones with appressed tips. Male flower: Outer perianth-segments 2, narrow, free; inner segments very small or one only longer and fringed. Stamens 3, rarely 4 or 5; anthers dark-coloured. Female flower: Outer segments 2 or 3, linear, at the base of the stipes; inner segments 3, linear, erect and appressed to the ovary, slightly fringed. Ovary 3-celled.

Queensland. Endeavour River, *Banks and Solander.*

8. **E. pallidum,** *R. Br. Prod.* 254.—Leaves in the few specimens seen broadly linear, 1 to 1½ in. long, tapering to a fine point. Scapes about as long. Flower-heads all very young except one which is nearly globular, something like those of *E. lividum*, but smaller, the bracts all obtuse, scarious, glabrous and rather shining. Male flower: Outer perianth-segments 2, linear; inner segments minute or obsolete. Stamens 3. Female flower: Outer segments 2, linear, inner 3, narrow, erect, ciliate. Ovary 3-merous,

Queensland. Endeavour River, *Banks and Solander.* I have not been able to examine the flowers satisfactorily.

9. **E. nigricans,** *R. Br. Prod.* 254.—Scapes filiform, 1 to 2 or rarely 3 in. long. Leaves shorter, sometimes very short, narrow-linear, tapering to a long fine point. Flower-heads globular or somewhat depressed, 1½ or nearly 2 lines diameter. Bracts scarious, shining and silvery white at the inflexed tips, sometimes dark in the lower part, a few outer empty ones obtuse, the flowering ones ovate-lanceolate, obtuse or almost acute. Male flower: Outer perianth-segments 3, linear, slightly dilated in the middle, all free; inner segments very small and glabrous or scarcely prominent Stamens 6. Female flower: Outer perianth-segments 1, 2, or 3, linear, at the base of the stipes; inner segments none. Ovary 3-merous.—*E. achiton*, Kœrn. in Linnæa, xxvii. 630.

N. Australia? Carron Creek, Carpentaria, *Gulliver*, the identification doubtful.
Queensland. Endeavour River, *Banks and Solander;* various localities in the neighbourhood of Rockhampton, *Bowman, O'Shanesy;* Dry-beef Creek, *Leichhardt.*

In the Banksian specimens the leaves are very few and shorter than the sheathing scales, but that appears to be owing to the plants being rather old and the larger leaves withered away. The species is probably not unfrequent in East India, closely resembling the smaller forms of *E. sexangulare*, but differing in the outer perianth-segments of the male flowers linear and entirely free.

10. **E. australasicum,** *Kœrn. in Linnæa,* xxvii. 616.—A slender annual nearly allied to the preceding species and to *E. sexangulare.* Scapes 1 to 3 in. high. Leaves shorter, linear or linear-lanceolate, tapering into a long fine point. Flower-heads globular, under 2 lines diameter, glabrous. Bracts ovate-lanceolate, acute or acuminate, often dark-coloured, a few outer ones rather broader more obtuse and empty. Male flower: Outer perianth-segments 2 or 3, very narrow and thin, inner segments very small and glabrous but showing the small glands. Stamens 6. Female flower: No perianth-segments inner or outer. Ovary on a short slender stipes, 3-merous.—*Electrosperma australasicum,* F. Muell. in Trans. Phil. Soc. Vict. i. 24.

Victoria. Murray River, *F. Mueller.*

11. **E. lividum,** *F. Muell. Fragm.* i. 92.—A dwarf plant but not so slender as the preceding species. Scapes 1 to 1½ in. long. Leaves mostly as long, linear, many-nerved, not very narrow. Flower-heads globular, dense, glabrous but not shining, 3 lines diameter or at length rather more. Bracts of a pale straw-colour, the outer empty ones ovate, obtuse, soon reflexed and at length almost concealed; flowering bracts obovate oblong or cuneate, rather acute, with inflexed tips. Male flower: Outer perianth-segments 3, oblong-spathulate, concave, connate often to above the middle into an unilateral 3-lobed scale; inner segments 3, spathulate, deeply fringed, with a small gland. Stamens 6. Female flower: Outer segments 3, oblong-spathulate, very concave almost complicate, with a rather narrow dorsal wing; inner segments 3, oblong, often slightly jagged at the end, with a small gland, abruptly contracted at the base into a short claw. Ovary 3-merous, the stipes short.

N. Australia. York Sound, *A. Cunningham;* near M'Adam Range, *F. Mueller.*

12? **E. concretum,** *F. Muell. Fragm.* i. 92.—Leaves in the only specimen seen under 1 in. long, several-nerved, linear, tapering to a fine point. Scape slender, 2 in. long. Flower-head globular, 1½ lines diameter, resembling those of *E. lividum* but the bracts more pointed. Male flower: Outer perianth-segments 3, united in an obovate concave spatha-like scale enclosing the rest of the flower; inner segments small, unequal. Stamens "6 or fewer." Female flower: Outer segments 2, concave, complicate, with a broad thick dorsal wing; inner segments 2, erect, linear-oblong, appressed but not concrete with the ovary. Ovary 2-merous.

N. Australia. Arnhem's land, *F. Mueller,* from a single imperfect specimen in his herbarium.

13. **E. Schultzii,** *Benth.*—Scapes slender, 3 to 4 in. high. Leaves very narrow-linear, mostly about 1 in long. Flower-head globular, white but glabrous. Bracts scarious almost hyaline, lanceolate, entire, spreading as in the East Indian *E. stellulata,* but much smaller, the whole head not exceeding 3 lines diameter. Male flower: Outer

perianth-segments 3 at the base of the stipes, equal, oblong-spathulate, concave, nearly as long as the bract; inner segments 3, small, ovate, fringed, with a gland. Stamens 6; anthers dark. Female flower: Segments 6, oblong-linear, all inserted very near to each other near the base of the short stipes, the 3 inner rather longer than the others, slightly jagged at the end, with a small gland; in some of the inner flowers the perianth much reduced. Ovary 2-merous or rarely 3-merous.

N. Australia. Port Darwin, *Schultz*, *n.* 288.

14. **E. tortuosum**, *F. Muell. Fragm.* i. 91.—Scapes rather slender, 4 to 8 in. long, much twisted. Leaves under 1 in. long, linear-lanceolate, many-nerved, tapering to a point. Flower-heads scarcely above 2 lines diameter; receptacle hairy; outer empty bracts few, oblong-lanceolate; flowering bracts spreading, cuneate-oblong or spathulate, slightly ciliate, rounded at the end with the midrib produced into a long rigid point. Male flower: Outer perianth-segments 3, nearly equal, linear, slightly dilated in the middle; inner segments very small and glabrous. Stamens 6. Female flower: Perianth-segments 6 according to F. Mueller, but in the only flower I could examine I only found 3, about the middle of the stipes, linear-oblong, contracted at the base. Ovary 3-merous.

N. Australia. Victoria river, *F. Mueller.* The specimens are in a very unsatisfactory state having lost almost all their flowers, but I cannot match them with any known species.

15. **E. monoscapum**, *F. Muell. Fragm.* i. 94.—A small slender species. Scapes filiform, 2 to 4 in. high. Leaves very narrow, fine-pointed, 1 to 1½ in. long. Flower-heads of a shining white, glabrous, scarcely 1¼ lines diameter when fully out. Outer empty bracts few, scarious, obtuse; flowering bracts appressed. Male flower: Outer perianth-segments 2, linear, slightly dilated in the middle, ciliate at the end; inner segments 2, very small, bearded and with a gland. Stamens 4. Female flower: Outer perianth-segments 2, linear-spathulate, incurved, acuminate, slightly hairy, rigid and very deciduous as in *E. spectabile;* inner segments 2, linear, erect, very narrow. Ovary 2-merous.

N. Australia. Margins of water-courses towards M'Adam range, *F. Mueller.*

16. **E. spectabile**, *F. Muell. Fragm.* i. 95.—Scapes striate, 3 to 6 in. high. Leaves more than half as long, broadly linear, tapering to a fine point. Flower-heads from a pale straw-colour to silvery-white, at first depressed but soon globular, about 3 lines diameter. Outer empty bracts obovate or almost orbicular, obtuse, almost herbaceous; flowering bracts ovate or the inner ones lanceolate, scarious and white but glabrous. Male flower: Outer perianth-segments 2, narrow, about halfway up the stipes; inner segments minute or obsolete. Stamens 4. Female flower: Outer segments 2, linear-spathulate,

falcate, concave but not winged, rather rigid, attached below the middle of the stipes but very deciduous; inner segments erect, hyaline, very narrow linear. Ovary 2-merous.

N. Australia. Sources of the Limmen Bight river, Gulf of Carpentaria, *F. Mueller.*

17. **E. scariosum**, *R. Br. Prod.* 255.—Scapes slender, striate, 3 to 5 in. long. Leaves thick at the base, tapering to a fine point, about 1 in. long. Flower-heads of a light brown colour, soon becoming globular, not above 2 lines diameter. Bracts orbicular, all scarious and glabrous, a few outer ones very obtuse and empty, the flowering ones shortly mucronate, the receptacle villous with long hairs. Male flower: Outer perianth-segments 2, linear, slightly-enlarged upwards, often slightly fringed at the end; inner segments reduced to two small teeth. Stamens 4. Female flower: Outer segments 2, falcate, concave or complicate with a broad dorsal wing; inner segments 2, erect, oval-oblong or obovate, denticulate at the end, shortly contracted at the base into a claw. Ovary 2-merous.

N. Australia. North coast? *R. Brown* (no label in his herbarium); Port Darwin, *Schultz, n.* 261.

18. **E. fistulosum**, *R. Br. Prod.* 255.—Evidently very near *E. scariosum* and most probably a variety only, with longer leaves, attaining more than half the scape, and the outer perianth-segments in the male flowers very narrow. I can find no other difference.

Queensland. Endeavour River, *Banks and Solander.*

19. **E. depressum**, *R. Br. Prod.* 255.—Scapes rigid, striate, 2 to 4 in. long. Leaves as in *E. scariosum* rather thick at the base, tapering to a fine point, short in many specimens (the longer ones having withered away?), but in other specimens more than half as long as the scape. Flower-heads pale-coloured, depressed-globular or hemispherical, nearly 3 lines diameter when fully out. Bracts all orbicular, a few outer ones more rigid and very obtuse, the others thinner and mucronulate, but all flowering. Male flower: Outer perianth-segments wanting; inner segments reduced to 2 small teeth. Stamens 4. Female flower: Outer segments in the flowers of the outer rows 2, falcate, concave or complicate with a broad dorsal wing, more or less connate, deficient in the inner rows of flowers; inner segments erect, obovate or oblong. Ovary 2-merous.—*E. heterogynum*, F. Muell. Fragm. i. 93.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* near M'Adam Range, Fitzmaurice River, *F. Mueller.*

20. **E. deustum**, *R. Br. Prod.* 255.—Very near *E. depressum* and perhaps a variety, differing only in its small stature and the very dark, almost black colour of its scapes and flower-heads. Scapes 1 to 2 in. high, scarcely exceeding the leaves. Flower-heads and flowers of the size and structure of those of *E. depressum*, the outer obtuse rather

rigid bracts rather more numerous, but all floriferous as in that species, and the inner female flowers similarly without outer perianth.

Queensland. Endeavour River, *Banks and Solander*. This is the species to which Banks and Solander originally gave the MS. name of *E. depressum*, which Brown transferred to the preceding species.

ORDER CXLI. CENTROLEPIDEÆ.

Flowers hermaphrodite or polygamous, sessile and solitary or several together within more or less herbaceous bracts, with or without 1, 2 or rarely 3 hyaline scales to each flower. Perianth none. Stamens 1, filament filiform, anther oblong or linear, 1-celled, versatile, opening in a longitudinal slit. Ovary 1, with 1, 2 or 3 collateral cells or 2 or more cells or carpels superposed in 2 rows, with 1 pendulous ovule in each cell or carpel; styles as many as cells or carpels, free or more or less united, terminating in linear stigmas. Fruits of the shape of the ovary, the pericarp membranous, the cells or carpels opening externally in longitudinal slits. Seeds 1 in each cell or carpel or fewer by abortion, pendulous and often laterally adnate to the pericarp; testa thin; albumen somewhat mealy. Embryo small, obovoid or conical, at the end of the albumen furthest from the hilum. —Small tufted plants, mostly annuals, with linear or filiform radical leaves and slender or very short scapes, or, in a genus not Australian, small densely tufted perennials with imbricate leaves. Flowers very small, in solitary terminal heads or spikes, rarely reduced to a single flower.

Besides the three Australian genera which are endemic, the Order includes one other, somewhat different in habit and inflorescence, ranging over New Zealand and Antarctic America. The whole Order has been worked up with great care by Georg Hieronymus in an elaborate memoir extracted from the twelfth vol. of the Abhandlungen der Naturforschenden Gesellschaft of Halle. I think however that the inflorescence divides it into more natural genera than the technical characters adopted by Hieronymus, and I cannot agree with him in considering the inflorescence within the bracts as a one-branched centrifugal cyme, called by him a *cicinnus*. The axis of this inflorescence is so exceedingly short that it is very difficult to follow out its evolution accurately, but where it is a little more developed, as in *Centrolepis Banksii* and *C. exserta*, and in the lowest bract of *Aphelia Drummondii*, it appears to me to be clearly a centripetal secund spike.

Flowers in a depressed head, surrounded by several (about 6) spreading bracts. Ovaries 1-celled with 2 or 3 styles, intermixed with stamens (1 to each ovary?) . .	1. TRITHURIA.
Flowers in a flat spike, with several distichous bracts, the lowest 1 or 2 with 2 or more flowers entirely or partly males, the others with 1 hermaphrodite or female flower. Ovary 1-celled, with 1 style	2. APHELIA.
Flowers within 2 alternate bracts, 1 or more in each bract, usually hermaphrodite. Ovary with 3 or more lobes and cells superposed in 2 rows very rarely reduced to 1 or 2, with 1 style to each lobe or carpel .	3. CENTROLEPIS.

1. TRITHURIA, Hook. f.

Flowers very numerous, in a terminal head, sessile within a few imbricate spreading bracts, probably hermaphrodite, with 1 stamen and 1 ovary each, but the stamens and ovaries so closely packed as to appear irregularly mixed. No perianth or inner scales. Stamens with a filiform filament and oblong anther. Ovaries 3-angled or flattened, with 1 perfect cell and 1 pendulous ovule; styles 3 or 2, filiform, free or shortly connate. Fruit 2- or 3-angled, opening between the angles in valves from the base upwards detached from the filiform angles.—Dwarf tufted annuals, with filiform radical leaves, and slender scapes bearing a single terminal head of minute flowers.

The genus is limited to southern Australia, and seems in some measure to connect *Centrolepideæ* with *Eriocauleæ*. The inflorescence is rather that of the latter, but the total absence of perianth or inner scales would place it rather with *Centrolepideæ*.

Bracts lanceolate, obtuse or scarcely acuminate. Fruits and seeds ovoid . . . . 1. *T. submersa.*
Bracts linear-lanceolate, acuminate. Fruits and seeds narrow-oblong . . . . 2. *T. occidentalis.*

1. **T. submersa**, *Hook. f. Fl. Tasm.* ii. 79. *t.* 138.—Leaves radical, linear-filiform, ¾ to 1 in. long. Scapes slender, sometimes very short, sometimes as long as or rather longer than the leaves. Bracts of the head 5 or 6 or sometimes 1 or 2 more, lanceolate, spreading, glabrous, about one line long, thin and pale with a darker central nerve, obtuse rather acute or scarcely acuminate, the outer ones empty, the inner ones close outside the flowers. Stamens with the anthers nearly as long as the bracts; ovaries much shorter though shortly stipitate, the styles not very long. Fruits mostly 3-angled, but some flattened with the edges thickened, very little more than ¼ line long.—*Juncella tasmanica*, F. Muell. Second Gen. Rep. 16 (name only).

Victoria. Mount Emu Creek, Axe and Hopkins Rivers, *F. Mueller.*
Tasmania. Bottom of a Lagoon near Macquarie Harbour, *Gunn;* South Esk River, *C. Stuart.*

2. **T. occidentalis**, *Benth.* Very near the longer-scaped specimens of *T. submersa*, but more slender. Scapes filiform, about 1 in. long. Leaves shorter and capillary. Head of the same size, but the bracts linear-lanceolate or almost linear and acuminate. Flowers still more numerous and smaller, the ovaries and carpels narrower. Seed linear-oblong, about ½ line long.

W. Australia, *Drummond, n.* 689.

2. APHELIA, R. Br.

(Brizula, *Hieron.*)

Flowers unisexual or polygamous, sessile and solitary within distichous bracts, or 2 or more together usually males within the lowest

1 or 2 bracts, each flower within one or two hyaline scarious scales, sometimes minute or wanting to the upper flowers. Stamen 1, filament filiform; anther linear or oblong. Ovary of a single 1-ovulate carpel, tapering into a single style with a linear stigma. Fruit slightly enlarged from the ovary, the membranous pericarp opening in a longitudinal slit.—Small tufted plants. Leaves radical, linear-filiform. Scapes slender, with a terminal flat ovate or lanceolate spike, the bracts complicate and distichously spreading, closely or loosely imbricate.

The genus is limited to Australia.

Bracts narrow, loosely imbricate, flowers mostly hermaphrodite except in the lowest bract . . . . . . 1. *A. cyperoides.*
Bracts rather broad, closely imbricate, flowers female and solitary in the upper bracts, 1 or more male in 1 or 2 lowest bracts.
  Spike nodding, lanceolate. Bracts all alike, the 2 outer with 2 or 3 male flowers in each. . . . . 2. *A. nutans.*
  Spike ovate, turned to one side, the outermost bract more erect than the others.
    Outermost bract narrow with 1, rarely 2 male flowers, the others hirsute without any or very minute inner scales . . . . 3. *A. gracilis.*
    Outermost bract broad with 6 or more male flowers, the others with a cristate keel, and an inner scale to the flower. . . . . 4. *A. Drummondii.*
  Spike ovate, erect, the lowest 2 bracts nearly equal, each with 1 or 2 male flowers. Inner scales of the female flower broad.
    Plant of ¼ to ¾ in. Upper bracts appressed, hairy, with the margins dilated and rounded at the base. South Eastern species . . . . 5. *A. pumilio.*
    Plant of 1 in. or more. Upper bracts with a winged or ciliate keel, otherwise glabrous. Western species. . . . . 6. *A. brizula.*

1. **A. cyperoides**, *R. Br. Prod.* 252.—Scapes 1 to 3 in. high. Leaves shorter, sheathing at the base with scarious margins sometimes slightly ciliate. Spike ovate, rather loose, the bracts narrow, acuminate, not keeled, the margins scarious and ciliate at the base, mostly about 2 lines long, the lowest 1 or 2 longer and each containing 1 or usually 2 flowers, 1 at least male only. Flowers in the other bracts (6 to 10), solitary and hermaphrodite, each flower with a hyaline lanceolate scale under the stamen, or rarely in the upper bracts the stamen and scale appear to be deficient.—Desv. in Ann. Sc. Nat. ser. 1, xiii. t. 2; Nees in Pl. Preiss. ii. 71; F. Muell. Fragm. v. 204; Hieron. Centrol. 94.

W. Australia. King George's Sound and neighbouring districts, *R. Brown*, *Preiss*, *n.* 1748, *Oldfield*, *F. Mueller* and others.

Hieronymus proposes to limit the genus to this species as having all the flowers solitary and hermaphrodite. I have however in all the specimens I have examined found 2 flowers in the lowest and sometimes also in the next bract, and one of them or sometimes both male only without any ovary.

2. **A. nutans**, *Hook. f. in Herb. Kew.*—Scapes 1 to 2 in. high. Leaves short. Spike nodding, lanceolate, 3 to 4 lines long and

scarcely 1½ lines broad. Bracts lanceolate, obtuse or scarcely acute, ciliate on the margins but not keeled and glabrous on the back, the 2 lower ones scarcely different from the others, each with 2 or 3 male flowers of 1 stamen each with a narrow scale; the other bracts (12 or more) with 1 female flower each, with a very small scale.

W. Australia, *Drummond, suppl. n.* 84.

3. **A. gracilis**, *Sond. in Linnæa*, xxviii. 227.—Scapes ½ to 1 in. high. Leaves as long. Spike ovate, about 2 lines long, the lowest bract narrow, acuminate, rather erect, throwing the spike to one side, glabrous or slightly ciliate, enclosing 1 or rarely 2 male flowers, each with a long scale under the stamen; the other bracts 5 to 9, ovate, thinly scarious, more or less hirsute, enclosing each a single ovary, without any scale or the scale very minute and reduced to a mere notch on the receptacle.—F. Muell. Fragm. v. 204; *Brizula gracilis*, Hieron. Centrol. 92; *A. Gunnii*, Hook. f. Fl. Tasm. ii. 75, t. 138.

Victoria. Darebin Creek, *F. Mueller;* Skipton, *Whan;* near Mount William, *Sullivan.*
Tasmania. Formosa, *Gunn;* South Esk River, *F. Mueller.*
S. Australia. Onkaparinga, *F. Mueller.*

4. **A. Drummondii**, *Benth.*—Scapes 1½ to 3 in. high. Leaves shorter and very fine. Spike broad, oblique or almost nodding, glabrous. Lowest bract broad, obtuse or scarcely acute, with scarious margins, about 2 lines long, not crested, enclosing 6 or more sometimes numerous male flowers, each with a scale under the stamen; the second bract nearly similar but smaller with fewer flowers; the other bracts 8 or more though the whole spike scarcely exceeds the outer bract, all ovate but narrower than in *A. pumilio*, the dorsal keel scariously crested or denticulate, each enclosing a single ovary in a rather broad scale.—*Brizula Drummondii*, Hieron. Centrol. 92.

W. Australia. Swan River, *Drummond. 1st coll. and n.* 933; Tone and Vasse Rivers, *Oldfield.*

5. **A. pumilio,** *F. Muell. in Linnæa*, xxviii. 226, *Fragm.* v. 204.—Scapes ½ to ¾ in. high and leaves not longer. Spike erect, broadly ovate, 2 to near 3 lines long; 1 or 2 outer bracts narrow with narrow scarious margins, acuminate, containing usually 2 male flowers, each of a single stamen enclosed at the base in an oblong scale; upper bracts 10 to 16, complicate, scarious, with short appressed hairs, the margins much dilated and rounded at the base, each containing one ovary enclosed in a broad complicate scarious scale.—Hook. f. Fl. Tasm. ii. 76; *Brizula pumilio*, Hieron. Centrol. 93.

Victoria. Lower Yarra and neighbourhood, *F. Mueller* and many others; Portland, *Allitt;* Wendu Vale, *Robertson.*
Tasmania. Cheshunt, *Archer* (I have not seen this specimen).
S. Australia. Mount Gambier, Rivoli Bay, *F. Mueller.*

6. **A. brizula,** *F. Muell. Fragm.* v. 203. Very near *A. pumilio*, but larger. Scapes usually 1 in. high and sometimes nearly twice as much. Spike erect, broadly ovate, 3 to 4 lines long and broad. Bracts rather broad, scarcely acuminate, the lowest 1 or 2 glabrous including each 2 or 3 male flowers like those of *A. pumilio*, the upper bracts slightly ciliate on the margin, the keel acute and ciliate or the cilia more or less connected in a dorsal wing, each enclosing an ovary with a scale not so broad as in *A. pumilio*.—*Brizula Muelleri*, Hieron. Centrol. 93.

W. Australia, *Drummond, n.* 934 *and suppl. n.* 44 *and* 119; Stirling Range, *F. Mueller.*

3. CENTROLEPIS, Labill.

(Desvauxia *and* Alepyrum, *R. Br.*)

Flowers hermaphrodite, several together or rarely solitary, sessile within 2 sheathing bracts, each one within 1, 2 or 3 hyaline scarious scales rarely entirely deficient. Stamen 1, filament filiform; anther oblong-linear, dorsally attached. Ovary of 3 or more carpels (rarely reduced to 2 or 1) laterally adnate and superposed in 2 rows to one side of a linear receptacle, each with 1 pendulous ovule; styles 1 to each carpel, all distinct or more or less united at the base, all undivided and ending in a linear-filiform stigma. Fruiting carpels slightly enlarged from the ovary and of the same shape; pericarp membranous, opening outwards in a longitudinal slit. Seed of the shape of the carpel and often laterally adnate to the pericarp; testa appressed; embryo small, obovoid or almost lenticular, in a mealy albumen, distant from the hilum.—Small tufted plants mostly annuals. Leaves linear-filiform, all radical. Scapes simple, terminating in the 2 bracts either close together or one a little distant from the other, both flowering or the lower one empty.

The genus is limited to Australia with the exception of one species, closely allied to an Australian one, recently found by Hance in South China.

- Spikes narrow, containing 1 to 4 flowers, the outer bracts erect and glabrous, inner scales few and narrow or none.
  - Flowers 1 or very rarely 2 in the spike. Leaves 3 or 4 lines long.
    - Scape shorter than the almost sessile spike . . . 1. *C. humillima.*
    - Scape usually 1 in. long or more. Outer bract aristate . . . . 2. *C. polygyna.*
  - Flowers 2 to 4 in the spike.
    - Scape 1 to 3 in. Outer bract with a long slender awn. An inner scale to each flower. Carpels 3, rarely 2 or 1. . . . . 3. *C. alepyroides.*
    - Scape under 1 in. Outer bract with a long awn. Inner scales very prominent . . . . . . 10. *C. aristata*, var.
    - Scape about 1 in. Leaves very short. Outer bracts scarcely pointed. No inner scales. . . 4. *C. mutica.*
    - Scape under 1 in. Leaves nearly as long. Outer bracts with a short awn. No inner scales. Carpels 6 to 10 . . . . 5. *C. glabra.*

Scape and leaves about ½ in. Outer bracts with a short awn. About 2 inner scales. Carpels 6 to 10 . . . . 6. *C. muscoides.*
Scape and leaves under ¼ in. Outer bracts scarcely acuminate. An inner scale. Carpel 1 . . . 7. *C. monogyna.*
Spikes ovate or broad, containing more than 4 flowers, the outer bracts glabrous or rarely with a few hairs erect or spreading, and 1, 2 or 3 scales under each flower, usually very prominent.
Leaves and scapes ½ to ¾ in. Flowers 4 to 6 in the spike.
Carpels usually fewer than 6. Southern plant. . 8. *C. pulvinata.*
Carpels usually more than 6. Tropical plant . . . 9. *C. pusilla.*
Scapes usually 1 to 2 in. Flowers 4 or more in each outer bract.
Outer bracts with long leafy points. Carpels usually 3 to 6. Southern and western species . . . 10. *C. aristata.*
Outer bracts shortly acuminate. Carpels usually 4 to 6. Southern and western species . . . . 11. *C. Drummondii.*
Outer bracts scarcely pointed. Flowers numerous. Carpels 10 to 20. Tropical species . . . . . 12. *C. Banksii.*
Spikes usually ovate or broad, the outer bracts hispid with long spreading hairs. Inner scales prominent.
Outer bracts scarcely spreading with awns usually longer than the bract.
Carpels usually 3. Styles free or nearly so. . . . 13. *C. fascicularis.*
Carpels 6 or more. Styles united to above the middle. 14. *C. pilosa.*
Outer bracts spreading with short points.
Carpels about 6. Extratropical species . . . . . 15. *C. strigosa.*
Carpels more than 6. Flowers very numerous. Tropical species . . . . 16. *C. exserta.*

Hieronymus, Centrol. 103, retains the name of *Alepyrum* for the New Zealand *A. pallidum*, Hook. f., which I think Hooker had more correctly at first published as a *Gaimardia* of which it has the characteristic habit, and from which it only differs in having 1 instead of 2 stamens. Hieronymus also attributes to it the superposed carpels of *Centrolepis* which I do not find, the ovary is not lobed but 2- to 4-celled with 2 to 4 styles. The capsule in *G. australis* opens loculicidally in 2 valves; in *G. pallida* I found it 1-celled and 1-seeded by abortion.

1. **C. humillima**, *F. Muell. Herb.*—A minute moss-like densely tufted plant, quite glabrous. Scapes scarcely any within a few linear recurved leaves, scarcely 3 lines long, with broad scarious sheathing bases, the inner ones reduced to the scarious sheath. Floral bract one only, almost sessile within the leaves, rather broadly linear and closely embracing the flower, tapering into a recurved point not exceeding the leaves. Flower 1 only, with a scarious complicate scale opposed to the bract and enclosing the stamen. Ovary of 3 or 4 carpels, the styles united at the base.

W. Australia. Salt lagoons north of Stirling Range, *F. Mueller.*

2. **C. polygyna,** *Hieron. Centrol.* 96.—Though slender and sometimes very small this species is more rigid than its nearest allies. Leaves capillary, usually 3 or 4 lines long. Scapes in the typical form usually about 1 in. long, though occasionally more than twice or scarcely half as much, of a rather dark colour as well as the floral

bracts which are close together, narrow, erect, rigid, glabrous, about 2 lines long, the outer one with a rigid awn at least as long and sometimes above twice as long, the inner one with a very short point. Flowers solitary or very rarely 2 together in the inner or upper bract, with a thin hyaline scale in all the specimens examined. Filament usually shortly adnate to the axis of the carpels, which I have not observed in other species. Carpels varying from about 6 to above 20; styles very shortly connate.—*Alepyrum polygynum*, R. Br. Prod. 253; Hook. f. Fl. Tasm. ii. 78; Nees in Pl. Preiss. ii. 71.

Victoria. Near Brighton, Murray and Axe Rivers, *F. Mueller.*
Tasmania. Near Georgetown, *Gunn.*
S. Australia. Rivoli Bay, *F. Mueller.*
W. Australia. King George's Sound and adjoining districts, *R. Brown*, *F. Mueller*, *Drummond*, *n.* 926, *Preiss*, *n.* 1736, *Oldfield.*

Alepyrum pumilio, R. Br. Prod. 253, from King George's Sound, *R. Brown*, and from Murray River, *F. Mueller*, appears to be only a small state of *C. polygyna*, the whole plant sometimes under ½ in. high.

3. **C. alepyroides**, *Hieron. Centrol.* 96.—Nearly allied to *C. polygyna*, but much more slender. Leaves ¼ to ½ in. long. Scapes capillary, 1 to 3 in. long. Floral bracts glabrous, erect, under 2 lines long, not so rigid nor so brown as in *C. polygyna*, the awn of the outer one 2 or 3 times as long as the bract and very slender. Flowers 2 to 5 in the upper bract, each one subtended by a hyaline linear or oblong scale. Carpels varying from 2 to 4 or 5 but in most ovaries 3, very rarely reduced to a single one, the axis always short.—*Desvauxia alepyroides*, Nees in Pl. Preiss. ii. 71.

N. S. Wales. Specimens in herb. F. Mueller from Hastings River, *Beckler*, appear to belong to this species, rather than to *C. polygyna*, but possibly there may be some mistake.
W. Australia. Swan River, *Preiss*, *n.* 1739; Vasse and Murchison Rivers, *Oldfield.*

The dwarf plant from Tasmania which I have after F. Mueller referred as a variety to *C. aristata*, closely connects that species with *C. alepyroides.*

4. **C. mutica**, *Hieron. Centrol.* 97.—Very closely allied to *C. glabra*, but the filiform leaves are scarcely above 3 or 4 lines long, whilst the slender scape is above 1 in. high, and the floral bracts have exceedingly short points. Flowers as in *C. glabra* about 4, without any hyaline scales. Carpels of the ovary fewer than in that species.—*Alepyrum muticum*, R. Br. Prod. 253.

W. Australia. King George's Sound, *R. Brown.*

5. **C. glabra**, *Hieron. Centrol.* 95.—A small glabrous plant with the habit of *C. muscoides*, but more slender. Leaves capillary, ½ to 1 in. long. Scapes very slender, sometimes slightly exceeding the leaves but more frequently shorter. Floral bracts close together, narrow, erect, the outer one about 1 line long besides the point or awn at least half as long, the inner one narrower, without any point. Flowers 4, of which 2 usually without any stamen, and no hyaline scales in any

of the heads examined. Carpels of the ovary about 8, rarely 10. Styles free or nearly so.—*Desvauxia glabra*, F. Muell. in Linnæa, xxviii. 226; *Alepyrum Muelleri*, Hook. f. Fl. Tasm. ii. 78.

Victoria. Mount Emu Creek, Edwards River, *F. Mueller;* Richardson River, *Miss Beal.*

Tasmania. Bottom of a lagoon on Macquarie River, *Gunn.*

W. Australia, *Drummond, n.* 929.

6. **C. muscoides,** *Hieron. Centrol.* 95.—A minute slender glabrous annual, growing in dense moss-like tufts of about ½ in. Leaves scarcely exceeding the spike, subulate, dilated at the base into imbricate sheaths, the innermost without laminæ. Floral bracts close together, erect, lanceolate, nearly 2 lines long, with short awns rather longer on the outer than the inner one. Flowers in the spikes examined 4, not separable into 2 clusters, 2 of them without stamens or hyaline scales, the 2 others with a narrow scale under the stamen. Carpels of the ovary usually 6 to 8 but sometimes only 4 or as many as 10.—*Alepyrum muscoides*, Hook. f. Fl. Tasm. ii. 77.

Tasmania. Marshy ground in subalpine situations about Marlborough, *Gunn.*

7. **C. monogyna,** *Benth.* A densely tufted moss-like plant under ½ in. high, closely resembling *C. muscoides* in foliage and habit. Leaves rather shining, with short scarious sheathing bases. Scape including the spike shorter than the leaves. Floral bracts glabrous, narrow, erect, a little distant from each other, scarcely acuminate, about 1 line long, each containing 1 hyaline scale not much shorter than the bract, 1 stamen and 1 ovary with a single carpel.—*Alepyrum monogynum*, Hook. f. Fl. Tasm. ii. 77, t. 138; *Aphelia monogyna*, Hieron. Centrol. 94.

Tasmania. Lake St. Clair and near Marlborough, *Gunn.*

This has entirely the habit and inflorescence of the smaller species of *Centrolepis*, and not at all those of *Aphelia*, in which it is placed by Hieronymus on account of the artificial character of the solitary carpel. It has moreover no male flower in the lower bract, and ovaries with a single carpel occur also occasionally in *C. alepyroides.*

8. **C. pulvinata,** *Desv. in Ann. Sc. Nat. ser.* 1, xiii. 42, *t.* 2.—A densely tufted little plant, with filiform leaves and scapes of ½ to ¾ in. Floral bracts a little distant from each other, ovate-lanceolate, spreading, very shortly pointed, scarcely above 1 line long, glabrous or the lower one slightly hairy. Flowers 1 or 2 in the upper bract, 2 or 3 in the lower one; hyaline scales rather long, 2 or sometimes 3 to each flower. Carpels of the ovary 3 to 6 or rarely 7.—Hieron. Centrol. 100; *Desvauxia pulvinata*, R. Br. Prod. 252; Guillem. Ic. Pl. Austral. t. 17.

Tasmania. Kent's Group, Bass's Straits, *R. Brown.* Said also by Hieronymus to be in South West Australia, but I have seen no specimens from thence.

9. **C. pusilla,** *Rœm. et Schult. Syst.* i. 44.—A small tufted plant with scapes and leaves of about ½ in. like *C. muscoides.* Floral bracts

close together and glabrous as in that species but somewhat spreading, obtuse or scarcely pointed, but little more than 1 line long. Flowers about 4 in the whole spike, with 1 or 2 hyaline scales to each flower rather prominent. Carpels of the ovary 6 to 7 according to R. Brown, 7 to 13 according to Hieronymus; styles free.—Hieron. Centrol. 97; *Desvauxia pusilla*, R. Br. Prod. 253.

Queensland. Point Lookout, *Banks and Solander.*

10. **C. aristata**, *Rœm. et Schult. Syst.* i. 44.—Leaves linear, sometimes very short and fine but often a few of them nearly ½ line broad and above 1 in. long. Scapes 1 to 2 in. high, or in luxuriant Western specimens twice that height, flattened under the spike. Floral bracts close together, glabrous, ovate, erect, 2 to near 3 lines long, with long leafy points, that of the lower bract often ½ in. and sometimes 1 in. long, the other one shorter. Flowers in each bract from 6 to about 20, intermixed with hyaline scales, some very narrow and entire, others broader and jagged at the end, always 1 under each stamen and 1 under or by the side of each ovary, with a few apparently additional ones. Carpels of the ovary few, varying from 3 or 4 to 6 or 7.—Hook. f. Fl. Tasm. ii. 76, t. 138; Hieron. Centrol. 99; *Desvauxia aristata*, R. Br. Prod. 253.

Victoria, *Robertson, Harvey;* near Mount William, *Sullivan.*

Tasmania. Abundant in wet sandy soil near Georgetown and Launceston, *Gunn;* South Esk River, *C. Stuart.*

S. Australia. Bethanie, Bugle Range, etc. *F. Mueller.*

W. Australia. King George's Sound, *R. Brown, F. Mueller* and others; and thence to Swan River, *Drummond, Oldfield.*

Var? *pygmæa*, F. Muell. A little fine-leaved tufted plant of ½ to 1 in. with few flowers or none at all in the lower bract and 2 or 3 in the upper bract, but intermixed with hyaline scales as in the typical *C. aristata*, connecting this species with *C. alepyroides* to which perhaps the present variety is more aptly referrible.—Southport, Tasmania, *Story.*

11. **C. Drummondii**, *Hieron. Centrol.* 98.—Leaves very fine, mostly about ½ in. Scapes capillary, 1 to 2 in. high. Spike oblong, glabrous. Floral bracts erect, about 2 lines long, shortly acuminate, one affixed from ½ to ¾ line below the other. Flowers 4 to 6 in each bract, with 1 or 2 hyaline scales to each, the one under the stamen the largest and often toothed or jagged at the end. Carpels of the ovary 4 to 8.—*Desvauxia Drummondii*, Nees in Pl. Preiss. ii. 70; *Centrolepis pulchra*, Hieron. Centrol. 99; *Desvauxia Urvillei*, Steud. Syn. Pl. Glum. ii. 267; *Centrolepis Urvillei*, Hieron. Centrol. 100.

W. Australia. King George's Sound to Swan River, *Drummond, 1st coll. and n.* 930; *Preiss, n.* 1809, *D'Urville, F. Mueller, Oldfield, Muir* and others.

Desvauxia brevifolia, Nees in Pl. Preiss. ii. 70 (*Centrolepis brevifolia*, Hieron. Centrol. 98), from King George's Sound, *Preiss, n.* 1749, which I have not seen, is from Nees's description as corrected by Hieronymus, not different from *C. Drummondii.*

12. **C. Banksii,** *Rœm. et Schult. Syst.* i. 44.—Very similar to *C. exserta*, but quite glabrous in all its parts. Leaves filiform mostly about ½ in. long, and scapes from that to 1 in. or rather more. Spike broad, the floral bracts very spreading, about 1½ lines long, ovate, acute or tapering into a short point. Flowers numerous in both bracts, the hyaline scales usually 2 to each flower and often as long as the outer bract. Carpels of the ovary from 10 to 20.—Hieron. Centrol. 99; *Desvauxia Banksii*, R. Br. Prod. 253.

N. Australia. Victoria River, *F. Mueller.*
Queensland. Endeavour River, *Banks and Solander.*

13. **C. fascicularis,** *Labill. Pl. Nov. Holl.* i. 7, t. 1.—Leaves ½ to 1½ in. long, usually ciliate below the middle with a few long hairs. Scapes slender, 1 to 3 in. high, glabrous or rarely sprinkled with a few short hairs. Floral bracts at a short distance from each other, ovate, hispid with long rigid hairs, 1½ to 2 lines long, with glabrous awns about the length of the bract or that of the lower bract longer. Flowers 4 to 8 in each bract, a hyaline scale under each stamen often as long as the bract and toothed at the end, and usually but not always a smaller scale under or by the side of each ovary. Carpels of the ovary 2 to 4; usually 3; styles nearly free.—Desv. in Ann. Sc. Nat. ser. 1. xiii. t. 2; Endl. Iconogr. t. 49; Hook. f. Fl. Tasm. ii. 77; Hieron. Centrol. 102; *C. cuspidigera*, Rudge in Trans. Linn. Soc. x. 283, t. 12; *Desvauxia Billardieri*, R. Br. Prod. 252; *D. longifolia*, Gaudich in Freyc. Voy. Bot. 418.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls* and others; New England, *C. Stuart.*
Victoria. Fitzroy River, *Robertson;* Grampians, *F. Mueller.*
Tasmania. Port Dalrymple, *R. Brown;* abundant in wet heathy places, *J. D. Hooker.*
S. Australia. Mount Lofty Ranges, *F. Mueller.*

14. **C. pilosa,** *Hieron. Centrol.* 102.—Very closely allied to *C. fascicularis*, with the same stature, foliage, hairs, and bracts, but the ovary appears constantly to have 6 or more carpels, and the styles are connate to a considerable height.

W. Australia, *Drummond.*

15. **C. strigosa,** *Rœm. et Schult. Syst.* i. 43.—Habit nearly that of *C. fascicularis*. Leaves often 1 in. long, hispid with rather rigid but not numerous hairs. Scapes usually rather longer than the leaves. Floral bracts placed near together, ovate, spreading, more or less hispid with long hairs, about 1½ lines long, with a spreading glabrous point usually shorter than the bract. Flowers usually 6 to 8 rarely more in each bract, each flower with 3 unequal hyaline scales, the larger one, under the stamen, as long as the outer bract, the others smaller or one sometimes deficient. Carpels about 6 to each ovary; styles shortly connate or almost free.—Hieron. Centrol. 101; *Desvauxia strigosa*, R. Br. Prod. 252; Guillem. Ic. Pl. Austral. i. 17.

N. S. Wales. Port Jackson, *R. Brown*, *R. Cunningham* and others.

W. Australia. King George's Sound, *R. Brown*, *Fraser*, *Drummond*; Middle Island, *Maxwell*. There does not appear to be any difference between the Eastern and Western specimens.

Var. *Patersoni*. Upper floral bract glabrous or nearly so, in other respects precisely the typical form.—*Desvauxia Patersoni*, R. Br. Prod. 252; *Centrolepis æmula*, Rudge in Trans.Linn. Soc. x. 284, from the synonym, but the figure t. 12 f. 2 is that of the typical *C. strigosa* with both the bracts hispid; *C. Patersoni*, Rœm. et Sch. Syst. 1. 43; Hieron. Centrol. 100.—Port Jackson, *R. Brown*.

Var. *tenuior*. Usually smaller than the typical form, the floral bracts with very short or scarcely any points, and the third hyaline scale to each flower very small or deficient.—*Desvauxia tenuior*, R. Br. Prod. 252; *Centrolepis tenuior*, Rœm. et Schult. Syst. i. 43; Hook. f. Fl. Tasm. ii. 76; Hieron. Centrol. 101.

N. S Wales. Port Jackson, *Woolls*.

Victoria. Yarra, Snowy River, etc. *F. Mueller*.

Tasmania. King's Island, *R. Brown*; various localities, *Gunn*, *Archer*, *Story* and others.

S. Australia. Bugle Range, *F. Mueller*.

16. **C. exserta**, *Rœm. et Schult. Syst.* i. 44.—Leaves shortly hairy, under 1 in. long. Scapes slender, pubescent or glabrous, 1 to 3 in. high. Floral bracts placed near together, very spreading, ovate-lanceolate, shortly awned or mucronate, hispid, about 2 lines long. Flowers numerous in each bract; hyaline scales usually 2 to each flower, nearly as long as the outer bract, often jagged at the end, and sometimes a third small one. Carpels of the ovary 6 to 10; styles very shortly connate.—Hieron. Centrol. 101; *Desvauxia exserta*, R. Br. Prod. 253; Guillem. Ic. Pl. Austral. t. 17.

N. Australia. Providence Hill and M'Adam Range, *F. Mueller*.

Queensland. Endeavour River, *Banks and Solander*; the same coast but particular station forgotten, *R. Brown*; North Queensland, *Armit*. *C. cambodiana*, Hance, from South China differs from this species chiefly in the larger size of all its parts.

ORDER CXLII. RESTIACEÆ.

Flowers unisexual, or very rarely and exceptionally hermaphrodite, mostly diœcious, either in spikelets, with imbricate dry rigid bracts or *glumes*, 1 under each flower and usually a few outer ones empty, or in 2 genera in narrow or spikelike panicles, the glumes not imbricate. Perianth of 6, rarely 5, 4 or 3 glumelike or scarious erect segments in 2 rows. Male flowers: Stamens 3, filaments filiform and free or united in a column; anthers oblong 1-celled and dorsally attached, or in 3 genera 2-celled with the cells dorsally attached in the centre only, the cells always opening by a longitudinal slit, a rudimentary ovary occasionally present in the centre of the flower. Female flower: Staminodia in some species 3, short and filiform with or without rudimentary anthers, in others entirely wanting. Ovary sessile or shortly stipitate, 1- 2- or 3-celled, with 1 pendulous ovule in each cell. Styles as many as cells, usually long linear or filiform and stigmatic along the inner side from below the middle or almost to the base, all free or more or less united at the base. Fruit dry, often hard, usually small, either 2- or 3-celled and 2- or 3-angled, opening along the angles, or 1-celled and either opening along 1-side, or an indehiscent nut. Seeds 1 in each cell, attached at or near the top, usually striate or minutely tubercular-rugose; testa appressed; albumen usually mealy. Embryo small, lenticular or obovoid, at the base of the albumen, at the end remote from the hilum.—Herbs usually perennial, with a rush-like or sedge-like habit, either with a tufted base or hard horizontal or creeping rhizome usually covered with closely-imbricate scales. Stems simple or branched, erect or flexuose and variously twisted. Leaves none or few, radical and long linear or sedge-like, but the stems usually bear at the base several closely imbricate dry scales and higher up a few sheathing scales the margins closed but not connate into a cylinder at least at the base, occasionally open at the upper end and often bearing a short or lengthened point or imperfect lamina, the upper sheaths, under the inflorescence and its branches, transformed into floral bracts, usually shorter, broader and more open than the stem-sheaths and sometimes the last long broad and spatha-like. Spikelets solitary or clustered and sessile or pedicellate within each floral bract, the flowers when in spikelets sessile or very shortly pedicellate without bracteoles and concealed under the glume, or when not in close spikelets having usually but not always a pair of bracteoles at their base.

The order is almost limited to extratropical South Africa, Australia and New Zealand. Of the eleven Australian genera two of the largest are also numerous in South Africa but without any identical species, one of them also represented in New Zealand, the other 9 are endemic.

Restiaceæ are closely allied in habit and inflorescence to *Cyperaceæ* and in the perianth to *Junceæ* but readily distinguished from both by the pendulous ovules and seeds. The great dissimilarity in habit and inflorescence between the males and females of some species often renders even their generic determination very difficult or uncertain from dried specimens, where only one sex is present or the sexes are mismatched. In some cases indeed the males of species belonging to different genera are more like each other than those of congeneric species, and, notwithstanding the copious materials before me, there are still some species in which I may not have correctly matched the two sexes, and in several others one sex is still unknown.

Ovary 2- or 3-celled. Styles or style branches 2 or 3.
Anthers 2-celled.
Flowers in spikelets with imbricate glumes. Male spikelets several-flowered. Filaments connate. Female spikelets 1-flowered . . . . 1. LYGINIA.
Flowers in a single terminal spikelet with imbricate glumes, either androgynous or the male and female similar. Stamens free . . . . 2. ECDEIOCOLEA.
Flowers in narrow or spikelike panicles, the glumes not imbricate and 2 bracteoles under each flower. 3. ANARTHRIA.
Anthers 1-celled.
Flowers in narrow or spike-like panicles, the glumes scarcely imbricate and usually 2 bracteoles under each flower . . . . 4. LEPYRODIA.
Flowers in spikelets with imbricate glumes, the spikelets several-flowered in both sexes or the females 1-flowered. . . . . 5. RESTIO.

Ovary 1-celled with a single ovule. Styles or style branches 3.
  Female spikelets several-flowered as well as the males. Pericarp usually opening laterally . . 6. LEPTOCARPUS.
  Female spikelets 1-flowered. Nut indehiscent . . 7. HYPOLÆNA.
Ovary 1-celled with a single ovule. Style undivided.
  Female spikelets 1-flowered. Stems much-branched. Sheathing scales persistent . . . . 8. LOXOCARYA.
  Female spikelets several-flowered as well as the males. Stems mostly simple. Sheathing scales very deciduous . . . . 9. LEPIDOBOLUS.
  Female spikelets densely clustered. Perianth of 3 narrow hyaline segments and 3 cilia. Males unknown . . . . 10. CHÆTANTHUS.
  Spikelets in both sexes solitary, terminal, several-flowered. Perianth of 3 narrow-clawed hyaline segments . . . . 11. ONYCHOSEPALUM.

Chætodiscus Gilberti, Steud. Syn. Pl. Glum. ii. 261, is too imperfectly described for identification but is probably Cyperaceous.

1. LYGINIA, R. Br.

Flowers diœcious, the males several together, the females solitary, in spikelets with imbricate glumes. Perianth-segments 6, glume-like, not exceeding the glumes. Male flower: Stamens 3, the filaments united almost to the top; anthers of 2 distinct cells dorsally attached in the centre only. Female flower: No staminodia. Ovary 3-celled; styles 3, shortly united at the base. Capsule 3-angled, opening at the angles.—Stems simple, with distant sheathing scales. Spikelets few, sessile and distant along a simple rhachis, or the females sometimes solitary and terminal.

The genus is limited to the single species, endemic in West Australia.

1. **L. barbata,** *R. Br. Prod.* 248.—Rhizome creeping, covered as well as the base of the stems with closely imbricate shining brown scales. Stems simple, erect or flexuose, rather slender, 1 to 2 ft. high. Sheathing scales appressed, ciliate at the top with long hairs and tapering into a spreading point in the typical form, with shorter points and few or no hairs in some varieties. Males: Floral bracts from 3 or 4 to 12 or more in an interrupted terminal spike, more or less acuminate or produced into a long point, densely or sparingly ciliate or quite glabrous. Spikelets closely sessile within the bract and scarcely protruding from it, solitary within each bract or rarely 1 or 2 additional imperfect spikelets in the lowest bract. Glumes dark brown, acuminate, nearly 3 lines long, most of them flowering, with few empty ones at the base. Perianth-segments nearly equal, rather shorter than the glumes. Filaments united in a long slender tube. Females: Spikelets few and often only a single terminal one. Glumes of the same length but broader than in the males, acuminate with a fine point, all empty but enclosing a single terminal flower. Perianth-segments nearly equal, rigid, acute, very much imbricate and rolled round the

ovary, rather shorter than the glumes. Style short and thick, with long plumose stigmatic branches. Capsule depressed, thick and hard, the angles very prominent.—Nees in Pl. Preiss. ii. 61 ; *L. symphyonema*, F. Muell. Fragm. viii. 79 ; *Schœnodum tenax*, Labill. Pl. Nov. Holl. ii. 80, t. 229 as to the male plant.

W. Australia. King George's Sound, *R. Brown* and others and thence to Swan River, *Drummond* 1st. coll. and n. 953 (♂) 952 (♀), Preiss, n. 1699, 1700, 1701 ; Murchison River, *Oldfield*.

L. imberbis, R. Br. Prod. 248, Nees. in Pl. Preiss. ii. 61, also from King George's Sound, only differs from the typical form in the want of the long hairs or cilia bordering the sheaths and bracts, but these hairs are often so few as gradually to connect the bearded with the unbearded specimens.

2. ECDEIOCOLEA, F. Muell.

Flowers unisexual, in a terminal spikelet with imbricate glumes. Perianth-segments 6, glume-like, not exceeding the glumes. Male flowers: Stamens 3, the filaments free; anthers of 2 distinct cells dorsally attached in the centre only. Female flowers: Staminodia 3. Ovary 2-celled, styles 2, free and stigmatic almost from the base. Capsule unknown.—Stems simple, with a single sheathing scale besides the imbricate ones at the base. Spikelets solitary.

The genus is limited to the single species, endemic in West Australia.

1. **E. monostachya,** *F. Muell. Fragm.* viii. 236.—Stems from a creeping rhizome erect, rigid but rather slender, 1½ to 2 ft. high. Sheathing scales at the base brown and shining, rigid, closely imbricate, short except the innermost which is often produced into a cylindrical sheath of 3 or 4 in., and on the stems only 1 closely appressed cylindrical sheath several in. below the inflorescence. Spike or spikelet oblong-conical or at length nearly cylindrical, ¾ to 1 in. long, of a dark brown, closely resembling that of *Lepironia* among Cyperaceæ but strictly terminal. Glumes ovate, obtuse, very numerous, rigid and closely imbricate, about 2 lines long, 2 or 3 of the outer ones shorter and empty, but no sheathing bract immediately under the spike. Perianth in both sexes very flat, about as long as the glumes, glabrous or slightly hairy at the tips, 2 outer segments concave-complicate, the third very flat and rather broad, 3 inner ones narrow and concave. Filaments rather short. Styles long.

W. Australia. *Drummond, 4th coll. n.* 342 ; Murchison River, *Oldfield*.

The flowers according to F. Mueller are diœcious, the only female flower however which I have been able to examine was taken from a spike in which there were certainly several males. The specimens are too few to determine whether the plant is habitually diœcious or androgynous.

3. ANARTHRIA, R. Br.

Flowers diœcious or rarely monœcious, in narrow or spike-like panicles, the glumes not closely imbricate and shorter than the perianths. Perianth-segments 6, glume-like. Male flowers: Stamens 3; filaments free; anthers of 2 distinct cells, dorsally attached in the centre only. Female flowers: No staminodia. Ovary 3-celled; styles 3, elongated, distinct, stigmatic almost or quite from the base. Capsule 3-angled or 3-lobed, opening at the angles.—Stems simple or branched, often flattened. Leaves long, radical or sheathing at the base of the stem. Long leafy bracts under the branches or inflorescence. Two bracteoles within the glume under each flower.

The genus is limited to West Australia.

Stems simple, more or less flattened. Panicle narrow, many-flowered, with a long deciduous leaf-like bract at the base.	
Stem and leaves very flat, 3 to 4 lines broad	1. *A. scabra*.
Stem and leaves flat, 2 to 3 lines broad	2. *A. lævis*.
Stem and leaves slightly flattened, under 1 line broad . .	3. *A. gracilis*.
Stems much branched. Panicles numerous, 3- to 6-flowered.	
Stems flattened, the numerous branches loosely curved or flexuose	4. *A. prolifera*.
Stems scarcely flattened, the branches erect and bushy, leafy throughout	5. *A. polyphylla*.

1. **A. scabra,** *R. Br. Prod.* 249.—Stems erect, rigid, very flat, 1 to 2 ft. high and 3 to 4 lines broad. Leaves all radical, as long and broad as the stems or rather longer, sheathing distichous and equitant at the base, the margins both of stems and leaves often scabrous-serrulate but sometimes quite smooth. No sheathing scales along the stem, but long leaf-like erect bracts under the inflorescence and one or two of its principal branches, all very deciduous leaving a prominent transverse line. Male flowers in a narrow dense thyrsoid panicle 4 to 6 in. long with numerous erect branches. Flowers nearly sessile on the branches at a little distance from each other, each one within a short lanceolate acuminate brown but thin bract or glume, with a pair of smaller bracteoles at the base of the very short pedicel. Perianth-segments narrow, acuminate, of a rich brown, 2 to 2½ lines long. Filaments shorter than the anthers, in the centre of a flat receptacle. Female flowers sessile or on very short curved rigid pedicels in the notches of a thick flat and flexuose simple or shortly branched rhachis, with a very narrow acuminate bract or glume and 1 or 2 bracteoles under each flower. Perianth-segments lanceolate, acuminate, 3 outer 5 to 6 lines long, 3 inner rather smaller. Capsule hard, laterally 3-lobed, about 3 lines broad, crowned by 3 short points, the bases of the styles.—Nees in Pl. Preiss. ii. 61; F. Muell. Fragm. viii. 80.

W. Australia. King George's Sound and adjoining districts, *R. Brown*, *A. Cunningham*, *Drummond*, *n.* 249 *and* 271; *Preiss*, *n.* 1730; *F. Mueller* and others.

2. **A. lævis,** *R. Br. Prod.* 249.—Stems 1 to 1½ ft. high, flat and rigid, with leaves as long as in *A. scabra* and similarly sheathing and equitant at the base, but both leaves and stem narrower, usually about 2 lines and always under 3 lines broad with smooth margins, the inflor-

escence much more compact and the flowers smaller. Male thyrsus dense, under 3 in. long, the outer leafy bracts or spathas very deciduous. Flowers nearly sessile within broad thin jagged bracts or glumes much shorter than the perianth, and 1 or 2 small lanceolate bracteoles. Perianth-segments brown, thin, lanceolate, about 2 lines long. Female inflorescence very dense, 1 to near 2 in. long. Glumes under the flowers very broad and often jagged. Perianth-segments about 1 line long, very broad. Ovary tapering into 3 long stigmatic styles.—Nees in Pl. Preiss. ii. 61; F. Muell. Fragm. viii. 81.

W. Australia. King George's Sound and Lucky Bay, *R. Brown*, *Baxter*; and probably from the same neighbourhood, *Drummond*, *n.* 343, 370, 866; *Preiss*, *n.* 1813, 1814, 1817; Forest Hill, *Muir.*

3. **A. gracilis**, *R. Br. Prod.* 249.—Stems usually about 1 ft. high, slightly flattened but like the leaves under 1 line broad, with obtuse smooth margins, and the leaves tapering into fine rigid points or sometimes nearly the whole lamina subulate. Inflorescence narrow and spike-like, 1¼ to 2 in. long, with short erect branches. Leaf-like spathaceous bracts under the principal branches very acute, mostly longer than the spike and rather more persistent than in the preceding species. Flowers sessile within hyaline or scarcely coloured glumes shorter than the perianth. Male flowers: Perianth-segments lanceolate, acute, light brown, about 3 lines long or in small specimens rather shorter; filaments rather short. Female flowers: Outer perianth-segments lanceolate, acute, about 2 lines long, the inner ones shorter, more obtuse and almost hyaline. Three staminodia in some specimens, none in others.—F. Muell. Fragm. viii. 81; *A. humilis* and *A. grandiflora*, Nees in Ann. Nat. Hist. ser. 1. vi. 50, and in Pl. Preiss. ii. 63; *A. ischæmoides* and *A. canaliculata*, Nees in Pl. Preiss. ii. 62.

W. Australia. King George's Sound, *R. Brown*, *F. Mueller* and others, and thence to Swan River, *Drummond* 1*st coll. n.* 904, also *n.* 73, 203, 344; *Preiss*, *n.* 1815.

Amongst F. Mueller's specimens there is one with the upper flowers female, whilst those at the base of the inflorescence are males.

4. **A. prolifera**, *R. Br. Prod.* 249.—Stems flattened, 1 to 1½ lines broad with acute edges, divided from near the base into flexuose or curved branches, usually clustered within the sheaths and the whole specimens extending to 1 to 2 ft. Radical leaves not numerous, as broad as the stem, 3 to 6 in. long, those under the branches gradually reduced to sheathing bracts open from the base; the lowest often 4 to 6 in. long, the upper ones much shorter, and within them are often 2 short brown sheathing bracts round the principal branch. Inflorescences terminating the flexuose branches or peduncles, usually reduced to 2 or 4 flowers. Perianth-segments in both sexes lanceolate, acute, about 4 lines long, or rather shorter in the females.—F. Muell. Fragm. viii. 82; *A. lævis*, *var.* Nees in Pl. Preiss. ii. 62.

W. Australia. King George's Sound, *R. Brown*, *Collie*, *Preiss*, *n.* 1727, *F. Mueller* and others; common in the sands, *Oldfield;* Swan River, *Miss Lukin.*

A. pauciflora, R. Br. Prod. 249, is founded on a single fragment from King George's Sound, which appears to me to be a branch from a slender specimen of *A. prolifera.*

5. **A. polyphylla,** *Nees in Pl. Preiss.* ii. 63.—Stems erect, slender, terete or slightly flattened, branching and almost bushy and leafy throughout, 6 to 8 in. high. Leaves subulate, mostly 2 to 3 in. long, with fine points, dilated into sheathing bases covering the stem but I do not find them distichous as described by Nees. Male inflorescence terminal, shortly pedunculate, simple or scarcely branched, shorter than the leaves and consisting usually of 3 to 6 flowers, the spathaceous bract at the base of the inflorescence lanceolate, acuminate, not exceeding the flowers, the glumes or bracts under each flower still shorter. Outer perianth-segments narrow-lanceolate, acute, nearly 3 lines long, the inner ones rather shorter and more obtuse. Filaments nearly as long as the segments and anthers about as long.—F. Muell. Fragm. viii. 83.

W. Australia, *Drummond;* near Gordon River, *Preiss*, *n.* 1691.

Some female specimens gathered by F. Mueller and referred by him to *A. prolifera*, appear to me rather to belong to the present species. They are more elongated than the males, attaining nearly 1 ft., but have the same narrow scarcely flattened stems and long-pointed leaves. The perianth-segments are however nearly 4 lines long and very acute.

4. LEPYRODIA, R. Br.

Flowers diœcious, monœcious, or rarely hermaphrodite, in narrow or spike-like panicles, the glumes not closely imbricate and shorter than the perianths. Perianth-segments 6, glume-like or thin and almost hyaline. Male flowers: Stamens 3, filaments free; anthers 1-celled. Female flowers: Staminodia usually 3, filiform clavate or with an abortive anther. Ovary 3-angled, 3-celled; styles 3, either distinct or more or less connate at the base, linear, stigmatic from the middle or almost from the base. Capsule 3-lobed or 3-angled, opening at the angles.—Stems simple or branched, leafless except the sheathing scales. Male and female inflorescences not very different. Bracteoles under each flower within the glume usually 2, deficient however in two species.

The genus is limited to extratropical Australia.

Eastern species. Outer perianth-segments as long as or longer than the inner.
  Tall plant. Sheathing scales loose. Floral bracts with long points . . . . 1. *L. scariosa.*
  Tall plant. Sheathing scales appressed. Floral bracts obtuse or shortly acuminate . . . . . 2. *L. Muelleri.*
  Stems very slender, apparently without sheathing scales. Spike-like panicle short and nearly simple . . . . 3. *L. anarthria.*

Eastern species. Outer perianth-segments at least in the males shorter than the inner. Sheathing scales closely appressed.
Stems slender, erect, scarcely branched, with a single spike-like panicle . . . . 4. *L. gracilis.*
Stems much-branched, erect or long and loose. Spikes narrow, usually numerous and paniculate . . . 5. *L. tasmanica.*
Stems loosely branched. Flowers in almost sessile distant clusters along the branches . . . . . 6. *L. interrupta.*
Western species. Inflorescence normal, with bracteoles to each flower within the glume.
Stems branched at the base, about 4 in. high. Sheathing scales very deciduous. Flowers hermaphrodite . . . . 7. *L hermaphrodita.*
Stems much-branched, near 1 ft. Sheathing scales persistent. Flowers monœcious . . . . . . 8. *L. monoica.*
Stems nearly simple, erect. Sheathing scales persistent. Outer perianth-segments shorter than the inner.
Glumes and bracteoles acute not aristate . . . . 9. *L. Muirii.*
Glumes and bracteoles aristate with fine points . . 10. *L. stricta.*
Stems nearly simple. Sheathing scales very deciduous leaving annular scars.
Stems densely tufted. Male perianths a little above 1 line long . . . . 11. *L. macra.*
Stems from a thick creeping rhizome. Male perianths about 2½ lines long . . . . . . 12. *L. Drummondiana.*
Western species. Flowers clustered in the panicles without bracteoles. Sheathing scales loose.
Sheathing scales erect. Perianth-segments acute or awned . . . . 13. *L. glauca.*
Sheathing scales spreading. Perianth-segments obtuse . . . . 14. *L. anæctocolea.*

1. **L. scariosa,** *R. Br. Prod.* 248.—Rhizome creeping. Stems erect, terete, glabrous, 1 to 2 ft. high. Sheathing scales brown, loose, often above 1 in. long and in some luxuriant specimens 2 in., the upper ones with short points. Inflorescence a narrow pale brown thyrsoid panicle, with short unequal erect branches, the lower ones often distant, the others more crowded. Bracts under the lower branches rigid with long points, under the upper branches smaller, broader and more scarious. Flowers sessile or shortly pedicellate within scarious glumes shorter than the perianth and 2 hyaline bracteoles at the base of the pedicel, sometimes very short, sometimes almost as long as the glume. Perianth-segments in both sexes about 2 lines long, lanceolate, acute, pale brown. Male flowers with a small rudiment of the ovary, females with slender staminodia.—F. Muell. Fragm. viii. 72; *L. hermaphrodita*, Nees in Sieb. Pl. Exs. n. 51, not of R. Br.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls*, and others; New England, *C. Stuart*.

2. **L. Muelleri,** *Benth.*—Rhizome creeping. Stems erect, often 2 ft. high or more. Sheathing scales appressed, ½ to ¾ in. long, some with rather long leafy points, the bracts under the inflorescence broad and loose, mostly without points. Flowers in compound spikes or

short dense often androgynous thyrsoid panicles, a terminal one of ½ to 1 in. and several smaller distant ones sessile or pedunculate within the sheathing bracts. Bracts within the inflorescence and glumes more scarious, obtuse or acuminate, broad or narrow. Perianth-segments in both sexes 1 to 1½ lines long, acute, the inner ones of the same length as or rather shorter than the outer.—*L. tasmanica*, F. Muell. Fragm. viii. 75, not of Hook. f.; *L. stricta*, F. Muell. Herb., not of R. Br.

Victoria. From Port Phillip to Gipps' Land, *F. Mueller.*
Tasmania. South Esk River. *C. Stuart.*
S. Australia. Near Mount Gambier, *F. Mueller.*

3. **L. anarthria,** *F. Muell. Fragm.* viii. 73.—Stems very slender, undivided, the longest in our specimens 16 in. long, without any sheathing scale or node, except at the base where there are a few short leaves with sheathing bases. Panicle narrow, dense and spike-like resembling that of *L. gracilis*, 1 to 1½ in. long. Flowers in the specimens all female, the outer perianth-segments acutely acuminate, about 1½ lines long, the inner narrower and rather shorter. Bracts scarious as in *L. scariosus*, but soon withering away. Capsule small, 3-celled, quite normal.—*Anarthria gracilis*, Nees in Sieb. Pl. Exs. n. 50; Kunth, Enum. iii. 478, but not of R. Br.

N. S. Wales. Port Jackson, or Blue Mountains, *Sieber.* Possibly a variety of *L. gracilis*, but the half dozen specimens I have seen in different herbaria are all without sheathing scales as in *Anarthria*, and the inner perianth-segments are certainly not longer than the outer.

4. **L. gracilis,** *R. Br. Prod.* 247.—Rhizome creeping, glabrous. Stems slender with a few long erect slender terete branches, 1 to 1½ ft. high. Sheathing scales appressed, or the upper ones rather loose. Flowers small, almost all shortly pedicellate in narrow almost spike-like panicles, a terminal one of 1 to 1½ or rarely 2 in. and often one or two smaller ones lower down, the bracts and glumes all small. Perianth-segments narrow, acutely acuminate, the inner ones scarcely 1 line long, the outer considerably shorter especially in the males, the females similar or the segments rather less unequal.—F. Muell. Fragm. viii. 73; *L. stricta*, Nees in Sieb. Pl. Exs. n. 32, not of Br.

N. S. Wales. Port Jackson, *R. Brown*, *Sieber*, *n.* 32 *and* 46, *F. Mueller* and others.

5. **L. tasmanica,** *Hook. f. Fl. Tasm.* ii. 72, t. 135.—Stems in the typical form from a creeping rhizome erect, branching from near the base, 1 to 2 ft. high, the branches long, slender and erect. Sheathing scales acuminate, appressed or the upper ones rather loose, often 1 in. long. Spikes numerous, short and slender, in a narrow terminal panicle, the upper bracts and glumes scarious. Male perianth-segments very acutely acuminate, the inner ones rather more than 1 line long, the outer ones considerably shorter. Female perianth similar but the segments nearly equal. Staminodia conspicuous, usually bearing small abortive anthers. Capsule small.

Tasmania. Detention River near Circular Head and Lake St. Clair, *Gunn;* Southport, *C. Stuart;* Gibson's Plains, *F. Mueller.*

Var. *laxa.* Stems long, weak, often decumbent, spikes much fewer and fewer-flowered, usually distant along the branches. I can find no other difference.—*L. paniculata,* F. Muell. 2d. Gen. Rep. 16 (name only); Fragm. viii. 73.

Victoria. Grampians, *F. Mueller* and others.

6. **L. interrupta,** *F. Muell. Fragm.* viii. 74.—Stems very slender, undivided or branched, often above 1 ft. long. Sheathing scales when below the branches closely appressed, rigid, with a short reflexed very deciduous point, those under the branches and clusters of flowers broad, loose, light-coloured or the upper ones scarious. Flowers in sessile clusters distant along the end of the stem, each cluster in the axil of a broad loose sheathing bract of 2 or 3 lines, the female flowers only 3 or 4 in the cluster, the male clusters more developed with more flowers. Glumes and bracteoles scarious, acutely acuminate, not much shorter than the perianths. Perianth-segments rigid, very acute, a little more than a line long, all nearly equal in the females, the inner ones longer and broader than the outer in the males. Filaments short in the males. Staminodia prominent in the females.

Queensland. Moreton Island, *F. Mueller;* Brisbane River, *Bailey.*
N. S. Wales. Port Jackson, *F. Mueller.*

Var. *flexuosa.* Older flowering branches emitting slender very flexuouse branches, often climbing to a considerable length like those of *Hypolæna gracillima.*

Victoria. Grampians, *Sullivan.* This plant referred to by F. Mueller, Fragm. viii. 76, appears to me to consist of elongated late branches of *L. interrupta,* the main stem from which they proceed with the broad loose sheathing scales and old clusters of flowers are quite those of that species.

7. **L. hermaphrodita,** *R. Br. Prod.* 248.—Stems shortly branching and densely tufted at the base without any creeping rhizome, erect or curved, usually about 4 in. high. Sheathing scales rather loose, all except the lowest very deciduous leaving annular scars. Spikes terminal, interrupted, nearly simple, about ½ in. long, the flowering bracts scarcely 2 lines long, brown and rigid but very deciduous. Flowers hermaphrodite, sessile or shortly pedicellate, solitary or 2 together within the lower bracts. Glumes and bracteoles short and scariose. Perianth-segments acutely acuminate, a little above 1 line long, all nearly equal. Anthers shortly exserted. Capsule small, 3-lobed, quite normal.—Desv. in Ann. Sc. Nat. ser. 1, xiii. t. 3. f. 3; F. Muell. Fragm. viii. 75.

W. Australia. King George's Sound, *R. Brown, F. Mueller.*

8. **L. monoica,** *F. Muell. Fragm.* viii. 76.—Stems divided almost from the base into numerous erect branches nearly 1 ft. high, most of them slender and often clustered but here and there one much stouter out-topping the others. Sheathing scales at the base of the stem short broad and imbricate and sometimes a closely appressed one on the undivided part, but usually only under the branches and then broad

loose and persistent. Flowers monœcious like those of *L. macra*, but the spikes more slender and interrupted, often irregularly compound and so numerous as to form an irregular much-branched panicle. Perianth-segments acute, a little above 1 line long, the greater number in our specimens females with staminodia, but several males mixed amongst them.

W. Australia, *Drummond, n.* 447.

Var. ? *foliosa*, F. Muell. Several of the sheathing scales enclosing, besides 1 or 2 branches, several linear leaves in the same cluster, each consisting of a short scarious sheathing base and a linear lamina of ½ to 1 in. or even longer.—Perongerup, *F. Mueller.*

9. **L. Muirii,** *F. Muell. Fragm.* viii. 78.—Rhizome thick and creeping. Stems rather slender but rigid, erect and undivided in all the specimens seen, from about 1 ft. to above 2 ft. high. Sheathing scales closely appressed, rarely above ½ in. long, the primary bracts in the panicle also appressed, those under the smaller branches minute. Panicle long narrow and interrupted, or when short almost spike-like. Glumes and bracteoles acute but not aristate, shorter than the perianths. Male flowers: Perianth-segments rather acute, rigid, scarcely above 1 line long, the outer segments rather shorter. Rudimentary ovary small within the stamens. Female flowers: Perianth-segments more equal rather smaller and more obtuse than in the males. Staminodia conspicuous. Styles 3 long and slender. Capsule under 1 line broad.

W. Australia, *Drummond, n.* 106 ♂, *and* 107 ♀; King George's Sound, *F. Mueller*; Lake Muir, *Muir*; Busselton, *Pries.* The species comes very near to the eastern *L. gracilis.*

10. **L. stricta,** *R. Br. Prod.* 248.—Rhizome hard and dense but probably creeping. Stems erect, simple or with a few long erect branches, mostly above 1 ft. and sometimes above 2 ft. high. Sheathing scales closely appressed or those under the branches scarcely loose, ½ to 1 in. long. Bracts under the panicle narrow, rigid, erect, under ½ in. long, those under the branches passing into the aristate glumes. Panicle thyrsoid, compact, usually narrow and 1 to 2 in. long, but sometimes more developed branching and 3 to 4 in. Glumes and bracteoles thin, more or less produced into fine capillary awns or points. Perianth in both sexes a little more than 1 line long, with the outer segments rather shorter than the inner.—*L. succedanea,* Nees in Pl. Preiss. ii. 60; F. Muell. Fragm. viii. 74.

W. Australia. King George's Sound and adjoining districts, *R. Brown, Drummond, Preiss, n.* 1710, *F. Mueller* and others. As far as our specimens go this and the preceding species appear to be diœcious, although the two sexes are very similar in their inflorescence and perianths.

11. **L. macra,** *Nees in Pl. Preiss.* ii. 60.—Stems densely tufted but without the creeping rhizome of *L. Drummondiana* or the branching base of *L. hermaphrodita,* erect, slender, 6 in. to above 1 ft. high. Sheathing scales, except the few imbricate ones at the base of the stem,

all very deciduous leaving annular scars; floral bracts thin, lanceolate, 3 to 4 lines long, also very deciduous. Spikes simple or slightly compound, about 1 in. long as in *L. hermaphrodita* and flowers very nearly of that species with very acute perianth-segments a little above 1 line long, but apparently monœcious, not hermaphrodite, our specimens however are all in fruit except occasionally some of the upper ones have a rudimentary ovary with 3 long filaments having lost their anthers.

W. Australia. Swan River, *Drummond, 1st coll. and n.* 902.

F. Mueller, Fragm. viii. 75, refers this to *L. hermaphrodita*, but besides the habit and stature the flowers in our specimens are certainly unisexual. Those described by Nees were small and starved, but the Kew and other collections contain others more than twice their size with a much more luxuriant inflorescence.

12. **L. Drummondiana,** *Steud. Syn. Glum.* ii. 248.—Rhizome creeping. Stems erect or flexuose, simple, rather slender, mostly about 1 ft. high. Sheathing scales appressed but very deciduous leaving annular scars, the few imbricate short broad obtuse ones at the base of the stem alone persisting, some of the lowest sometimes bearing leafy appendages; flowering bracts also very deciduous, lanceolate and thin. Short spikes or clusters simple or compound, sessile within each bract, forming an interrupted terminal spike-like panicle, similar in the males and females. Glumes thin, lanceolate, the lower ones as long as the flowers; bracteoles shorter, thin, acutely acuminate. Male flowers: Outer perianth-segments rigid, acutely acuminate, 2½ lines long, the inner ones rather shorter. Female flowers similar but smaller, the whole perianth scarcely 2 lines long. Staminodia small. Capsule normal but not so broad for its length as in most species.—F. Muell. Fragm. viii. 75.

W. Australia, *Drummond, n.* 395 ♂, and 347 ♀.

13. **L. glauca,** *F. Muell. Fragm.* viii. 77.—Rhizome thick and creeping. Stems stout, rigid, erect, 2 or 3 ft. high, simple or with a few long erect branches. Sheathing scales loose but erect, often 1 to 2 in. long. Panicle narrow, interrupted, 3 or 4 in. long with sometimes a spike much lower down. Sheathing bracts under the main branches ovate-lanceolate, the lowest ⅓ to ½ in. long, but passing gradually into the short ovate almost scarious bracts under the smaller branches, and these again into the still smaller ovate scarious glumes, the last bracts enclosing a head of 3 to 7 almost sessile flowers, each within a small scarious glume without bracteoles, except the central flower in the females, which has usually 1 or 2 bracteoles within the glume. Perianth in both sexes about 1 line long, the outer segments with a fine point or short awn, the inner ones rather longer and acute, without any awn. No rudimentary ovary in the males and staminodia rare in the females. Capsule about 1 line diameter, rather broader than long. Style variable, in some flowers with very small perhaps imperfect ovules the style is at least twice as long as the ovary and divided to the middle only, in others with more perfect ovules, the whole style is scarcely longer than

the ovary and divided almost to the base.—*Leptocarpus glaucus*, Nees in Pl. Preiss. ii. 64.

W. Australia. Swan River, *Drummond, 1st coll.*, *Preiss, n.* 1693; Blackwood and Gordon Rivers, *Oldfield*; Busselton, *Pries.*

14. **L. anæctocolea,** *F. Muell. Fragm.* viii. 78.—Rhizome hard and creeping; stems erect; about 2 ft. high, rather slender, with erect branches, terete below the branches, but the branches semi-terete with the flat sharp-angled sides facing each other. Sheathing scales loose, 1 in. long or more, spreading from below the middle. Male panicle long and narrow, interrupted, the lower bracts like the sheathing scales of the stem, the upper ones and those on the smaller branches very small, passing into the small thinly scarious hyaline glumes which are shorter than the perianths. Flowers as in *L. glauca*, almost clustered and sessile within the glumes without bracteoles. Perianth-segments very thin, pale brown, almost hyaline, all obtuse, the outer ones ovate, about ¾ line long, the inner oblong, 1¼ lines long. Stamens exserted, without any rudimentary ovary. Females unknown.

W. Australia, *Drummond.*

5. RESTIO, Linn.

(Megalotheca, *F. Muell.*)

Flowers diœcious, both sexes several together or the females solitary, in spikelets with imbricate glumes and no bracteoles. Perianth-segments 4, 5 or 6, glume-like or the inner ones almost hyaline, not exceeding the glumes. Male flowers: Stamens 3, filaments filiform, free; anthers 1-celled. Rudimentary ovary small or none. Female flowers: Staminodia 3 or none. Ovary 2- or 3-celled; styles 2 or 3, free from the base or very shortly connate, stigmatic almost from the base. Capsule flat and 2-celled or 3-angled and 3-celled, the cells opening at the angles or very rarely irregularly breaking up on the sides.—Stems simple or branched, leafless except the sheathing scales which are usually persistent. Male and female inflorescences similar or very different, the male spikelets either pedicellate and paniculate or sessile along the branches, the females often more sessile, solitary, clustered or spicate, but sometimes paniculate like the males. The young plants of the first year in several species have two or three of the sheaths at the base of the stem produced into short linear leaves.

The genus is very largely represented in South Africa, without however a single species identical with the Australian ones which are all endemic. Among those here described there are still several in which either the sexes may have been mismatched or one sex as yet unknown and are therefore somewhat uncertain.

Sect. I. **Choristogynia.**—*Male spikelets several flowered; females 1-flowered. Stems much branched. Male spikelets sessile along the branches; females terminal or pedunculate.*

Male flowering branches numerous, erect, slender. Spikelets linear. Capsule very small . . . . 1. *R. fastigiatus.*

Male flowering branches elongated. Spikelets ovate distant almost from the base . . . . 6. *R. dimorphus.*

Male spikelets oblong or almost ovoid. Capsule 2 lines diameter . . . . 2. *R. megalotheca.*

SECT. II. **Stachygynia.**—*Both male and female spikelets several flowered* (*in some species however the females unknown*).

Spikelets (in both sexes?) small and numerous in a dense terminal panicle.

Spikelets ovoid, very shining, with fine-pointed glumes. Tropical species . . . . 3. *R. tropicus.*

Spikelets nearly globular, dull brown, obtuse. Western species . . . . 4. *R. applanatus.*

Spikelets (in both sexes?) terminating branches or rigid peduncles or sessile along the branches.

Sheathing scales loose and spreading, obtuse. Eastern species.

Stems rigid and glabrous. Spikelets solitary or few . . . . 5. *R. monocephalus.*

Stems slender, glabrous. Spikelets numerous . 6. *R. dimorphus.*

Sheathing scales acuminate, loose or erect. Western species.

Stems tomentose-villous. Sheathing scales loose. Spikelets numerous . . . . 7. *R. confertospicatus.*

Stems glabrous, rigid, under 1 ft. often flexuose.

Spikelets solitary or few, ovoid, about 3 lines long . . . . 8. *R. sphacelatus.*

Spikelets several, ovoid, about 4 lines long. Glumes with fine points . . . . 9. *R. deformis.*

Spikelets several, ovate, 2 lines long, the females longer and narrow . . . . . . 10. *R. crispatus.*

Spikelets numerous, small, globular . . . . 11. *R. nitens.*

Stems glabrous, slender, above 1 ft. erect. Spikelets small.

Rhizome glabrous. Male spikelets narrow-ovoid, about 3 lines long . . . . 12. *R. gracilior.*

Rhizome white-woolly. Scales rather loose. Spikelets narrow, the males about 2 lines, the females 3 to 4 lines long . . . . . . 13. *R. chaunocoleus.*

Spikelets in both sexes nearly similar, mostly erect and shortly pedicellate, on a simple rhachis or in a narrow interrupted panicle.

Sheathing scales obtuse and erect. Eastern species.

Stems simple, terete.

Spikelets few, at least 4 lines long. Upper sheathing scales loose . . . . 14. *R. australis.*

Spikelets numerous, 2 to 3½ lines long. Sheathing scales all closely appressed . . . . 15. *R. gracilis.*

Stems very flat . . . . 16. *R. complanatus.*

Stems terete, tall, with dense clusters of fine barren branches. Spikelets numerous . . . 17. *R. tetraphyllus.*

Sheathing scales spreading, obtuse. Western species 18. *R. laxus.*

Male spikelets suspended on filiform pedicels. Females sessile. Western species.

Sheathing scales loose, dilated and spreading upwards. Quite glabrous . . . . 18. *R. laxus.*

Stems cottony-villous. Sheathing scales ciliate
with white hairs . . . . 19. *R. ornatus.*
Sheathing scales erect, appressed.
Stems slender, terete. Sheathing scales acuminate or aristate . . . . 20. *R. leptocarpoides.*
Stems terete. Sheathing scales obtuse . . . . 21. *R. amblycoleus.*
Stems flat. Spikelets almost globular . . . . 22. *R. tremulus.*

R. abortivus, Nees in Pl. Preiss. ii. 60, described from a male specimen of Preiss's from Cape Riche, is unknown to me and the genus must remain uncertain. *R. curvulus*, Nees in Ann. Nat. Hist. ser. i. vi. 50, described from a Swan River male specimen of Drummond's first collection, is without doubt one of the species of *Restio* or *Leptocarpus* here included, but the character given is insufficient for identification.

SECTION I. CHORISTOGYNIA.—Stems much branched. Male spikelets several-flowered, sessile along the branches. Female spikelets 1-flowered, terminating the branches or peduncles, or few sessile along the branches.

1. **R. fastigiatus**, *R. Br. Prod.* 246.—Rhizome creeping, woolly-hairy. Stems erect, slender, from 1 to above 2 ft. high, divided in the upper part into numerous erect slender flowering branches. Sheathing scales closely appressed; lower flowering bracts nearly as long as the spikelets. Spikelets numerous, terminal or sessile along the branches or sometimes all pedunculate in the females, very narrow, about 2 lines long. Glumes obtuse or shortly mucronate, often ciliate, especially the outer empty ones. Male flowers several in the spikelet. Perianth-segments 6, narrow, nearly equal. Stamens 3. Female spikelet resembling the male except that the glumes are more mucronate and empty, with a single terminal flower. Perianth-segments as in the males all linear and rigid, but the 3 inner ones broader, more closely imbricate, enveloping each other and the ovary. No staminodia. Ovary 2-celled, the style elongated with rather short stigmatic branches.—F. Muell. Fragm. viii. 67; *R. lateriflorus*, Nees in Sieb. Pl. Exs. n. 42, not of R. Br. and erroneously referred by Spreng. Syst. Cur. Post. 26 to *R. tropicus*; *Calorophus Sieberianus*, Steud. Syn. Glum. ii. 265.

N. S. Wales. Port Jackson, *R. Brown*, and many others.

The female specimens are very rare in collections, some gathered by C. Moore have the habit and inflorescence of the males, in others gathered by Armstrong the spikelets are all solitary and terminal or on long peduncles. In all the females I have examined the spikelets are 1-flowered, although the glumes are nearly as numerous as in the males.

2. **R. megalotheca**, *F. Muell. Fragm.* viii. 99.—Stems erect, branching, 1 to 2 ft. high, terete or nearly so, usually slightly canescent and striate. Sheathing scales closely appressed, obtuse or with a short fine point. Male spikelets terminal or sessile along the small branches of a loose panicle, several-flowered, narrow-ovate and about 1½ lines long in some specimens, broader and 2 lines long in others. Glumes dark brown, the outer empty ones short broad with rather long points, the flowering ones gradually narrower with shorter points. Perianth-segments 6, linear, the 2 outer ones complicate, the others flat. Female

spikelets terminal, with rarely a sessile one lower down, about 4 lines long. Glumes not numerous, broad, 2 or 3 outer ones much shorter and obtuse, the next acuminate. Flower solitary and terminal. Perianth-segments 4 to 6? broad and thin, the outer not much shorter than the glume, the inner gradually much shorter and sometimes very small. Ovary 2-celled; style as in *R. fastigiata* elongated, rather thick, with 2 stigmatic branches rather shorter than the entire part. Capsule broad, thick and hard, fully 2 lines diameter, opening at the angles.—*Megalotheca striata*, F. Muell. l. c.

W. Australia. *Drummond, 1st coll. and n.* 950; also *suppl. n.* 103 and *n.* 186.—Masters only found 4 perianth-segments in the female flower of the specimen he examined; in the one I examined there appeared to be 2 outer and 3 inner ones, but the specimens are in fruit and the remains of the perianth much broken.

SECTION II. STACHYGYNIA. Stems various. Female spikelets, where known, containing several flowers as well as the males.

3. **R? tropicus,** *R. Br. Prod.* 246.—Rhizome not seen. Stems stout, undivided, above 2 ft. high. Sheathing scales closely appressed, acute. Male spikelets very numerous in a much branched thyrsoid or pyramidal panicle of 4 to 6 in., nearly sessile along the almost filiform branches. all of a rather light shining brown, about 2 lines long. Glumes almost scarious, broadly lanceolate, tapering to a fine point, 1 or 2 outer ones shorter and empty. Perianth segments 5, 2 outer ones narrow, acuminate, complicate, 3 inner ones shorter broader hyaline and almost obtuse. Female plant unknown.

N. Australia. Gulf of Carpentaria, *R. Brown.*

The female plant being unknown the genus of this species must remain uncertain, it may very possibly be a *Leptocarpus*, the male inflorescence is however very different from that of any other species of either genus.

4. **R. applanatus,** *Spreng. Syst.* i. 185.—Rhizome very densely tufted, shortly horizontal in the specimens seen. Stems simple, rigid, slender, slightly compressed, 2 ft. high or more. Sheathing scales closely appressed, mostly obtuse; the floral bracts small and short. Male spikelets numerous in a short terminal panicle, the short but very unequal branches clustered within the bracts and more or less divided. Perianth-segments 5 or 6, narrow. Female panicle more crowded than the male, the spikelets nearly globular, dark brown, about 1½ lines diameter. Glumes ovate, obtuse. Flowers not very numerous, the lower ones often reduced to empty perianths and the lowest glumes quite empty. Perianth glabrous or slightly ciliate. Ovary usually 3-celled. Styles free almost from the base, long and involute. Staminodia 3. Capsule normal.—F. Muell. Fragm. viii. 69; *R. compressus*, R. Br. Prod. 245, not of Rottb.

W. Australia. King George's Sound, *R. Brown*, also in *Drummond's* collection, the number illegible but more like 104 than 707.

Sprengel's name, selected without having seen the plant, is very inappropriate, for the stem though compressed is not flat.

5. **R. monocephalus,** *R. Br. Prod.* 245.—Rhizome creeping, woolly-hairy Stems in the typical form simple or with a few flowering branches in the upper part, about 6 in. high, each stem or branch terminating in a single or rarely 2 spikelets, but a few specimens show a variety or luxuriant state attaining 1 ft. with several even as many as 25 spikelets in a narrow panicle. Sheathing scales short, loosely obovate or oblong, obtuse, spreading upwards. Spikelets dark-coloured, from broadly ovate to almost oblong, about 3 lines long, the males usually narrower than the females. Glumes oblong, obtuse, often loosely hairy outside as well as the perianths. Perianth-segments in both sexes usually 6, narrow, rather obtuse. Stamens exserted. Staminodia in the females very unequal and variable. Ovary 2-celled; styles at first connate at the base at length free or nearly so. Capsule opening at the edges.—Hook. f. Fl. Tasm. ii. 70. t. 135; *R. oligocephalus*, F. Muell. Fragm. viii. 68.

Tasmania. Derwent River, *R. Brown*; not uncommon in various parts of the Colony, *J. D. Hooker*, and others. A specimen of Labillardière's in herb. DC. is also probably from Tasmania.

6. **R. dimorphus,** *R. Br. Prod.* 246.—Rhizome creeping, but the woolly hairs not abundant. Stems slender, 1 to 2 ft. long, divided into weak branches all floriferous, often from near the base. Sheathing scales rather broad, loose and open almost from the base, spreading upwards, obtuse and glabrous; floral bracts shorter than the spikelets. Male spikelets numerous, ovate, sessile or nearly so within the bract, distant along the branches or terminal, about 2 lines long. Glumes obovate or oblong, acuminate with a rather short point, not at all or scarcely ciliate, several outer ones empty. Perianth-segments 6. Filaments shortly callous at the base but no rudiment of the ovary. Female plant: Spikelets fewer and more distant, all sessile and 1-flowered in the specimens examined but with several empty glumes. inner glumes acuminate, 1½ lines long, with rather long points. Perianth-segments 5 (or 6?), oblong, obtuse, nearly equal. Ovary in the specimens examined 2-celled, or according to Brown 3-celled. Styles united at the base. Capsule hard, broad, opening at the sides and frequently 1-celled by abortion and then very oblique.—F. Muell. Fragm. viii. 68.

N. S. Wales. Port Jackson, *R. Brown*, *Sieber*, *n.* 40 *and* 44, *C. Moore* and others.
Queensland? The specimens from Moreton Island referred by F. Mueller to this species have similar slender stems and open sheaths, but the branches terminate in single male spikelets much longer than in the ordinary *R. dimorphus*. They are however in a very imperfect state.

7. **R? confertospicatus,** *Steud. Syn. Glum.* ii. 256.—Rhizome densely tufted, scarcely creeping. Stems erect, simple or with short flowering branches clustered in the bracts, from under 1 ft. to about 1½ ft. high, tomentose and shortly villous or at length glabrous. Sheathing scales loose and open from the base, spreading upwards, obtuse with or without a small point, usually cottony-ciliate on the margin. Floral bracts broad, all except the lowest shorter than the

spikelets. Male inflorescence commencing from below the middle of the stem. Spikelets sessile in dense tufts or heads of 3 to 8 or 10 or rarely solitary, the heads either all sessile and distant, or here and there a pedunculate head issuing from the same bract, or in other specimens several peduncles or branches clustered with the sessile head, each bearing 1 to 4 heads or solitary spikelets, each spikelet narrow-ovate, 2½ to 3 lines long. Glumes narrow-ovate, ciliate at the end, with a rigid point or short awn, 3 or 4 lower glumes empty. Perianth-segments 5 or 6, all narrow, the inner ones very thin. No rudimentary ovary. Females unknown.

W. Australia, *Drummond, n.* 341; sand plains, Upper Kalgan River, *F. Mueller.* The species appears in many respects allied to *R. dimorphus.*

8. **R.? sphacelatus,** *R. Br. Prod.* 246.—Stems erect with flexuose branches, terete or very slightly compressed, rigid, glabrous, 6 to 8 in. high. Sheathing scales appressed, slightly ciliate, rounded at the end, with a small point. Male spikelets all terminal, ovate, dark-coloured, scarcely 3 lines long. Glumes ovate, obtuse or with very short points, 2 or 3 outer ones empty. Perianth very flat, segments 5 in the flowers examined, 6 according to R. Brown, 2 outer ones linear complicate, 3 inner lanceolate and flat. Filaments rather long. Rudimentary ovary minute. Females unknown.

W. Australia. Lucky Bay, *R. Brown.* Apparently allied to *R. deformis.*

9. **R. deformis,** *R. Br. Prod.* 245.—Rhizome creeping, the white woolly hairs copious, but sometimes wearing off. Stems under 1 ft. high, terete, erect and simple or with few flexuose branches, quite glabrous. Sheathing scales appressed, dark brown, tapering to a short fine point. Floral bracts broad and acuminate but closely embracing the base of the spikelet or short peduncle. Male spikelets ovoid, dark-coloured, about 4 lines long, terminating the branches and usually 1, 2 or more sessile or shortly pedunculate lower down. Glumes rather broad, acuminate with rigid points very short on the inner glumes rather long on the outer ones, the lowest empty glumes short. Perianth-segments 5, slightly ciliate, 2 outer ones narrow, complicate, 3 inner flat and narrow-lanceolate. Rudiment of the ovary minute. Female inflorescence similar, but the spikelets rather smaller, with several flowers. Perianth-segments not ciliate. Ovary 2-celled. Style 2-cleft. Capsule 2-celled and regular, or 1-celled by abortion and oblique.

W. Australia. Lucky Bay, *R. Brown;* also *Drummond, n.* 96.

10. **R. crispatus,** *R. Br. Prod.* 246.—Very near *R. deformis*, but taller and more slender, the short flexuose flowering branches numerous, giving it almost the aspect of a *Caustis*, the rhizome glabrous or nearly so, with several barren flexuose branching stems. Sheathing bracts and inflorescence of *R. deformis.* Male spikelets ovate, about 2 lines

long. Perianth-segments narrow. Glumes with short rigid points. Female spikelets about 3 lines long, narrow. Glumes acuminate. Flowers 2 in the spikelet examined. Perianth-segments 6. Capsule of the lower flower 1-celled by abortion, very oblique, the style bipartite, in the upper flower 2-celled and regular.

W. Australia. Lucky Bay, *R. Brown.*

11. **R.? nitens,** *Nees in Pl. Preiss.* ii. 59.—Rhizome creeping, with very little wool, the imbricate scales on the rhizome and base of the stem very rigid and shining brown. Stems under 1 ft. high, paniculate and flexuose almost from the base, quite glabrous. Sheathing scales rather loose, obtuse or shortly pointed or one below the branches closely appressed. Spikelets in our specimens numerous, sessile or on short rigid erect peduncles, globular and scarcely 2 lines diameter, apparently female, but all diseased except a few young buds in which I found 6 perianth-segments rather short and broad, 2 outer concave, the others flat, no staminodia, and a 2-celled ovary terminating in 2 short points; in all the other heads both in Drummond's and in Preiss's specimens the ovaries are converted into ovoid acute utricles filled with black granules (*Uredo Restionis,* Nees).

W. Australia. Swan River, *Drummond, 1st coll., Preiss, n.* 1696, perhaps all the specimens from the same gathering, as Preiss and Drummond were for some time together.

12. **R.? gracilior,** *F. Muell. Herb.*—Rhizome creeping, with very little wool. Stems slender, 1 to 2 ft. high, erect with several erect branches, quite glabrous, sulcate-striate. Sheathing scales narrow, closely appressed, obtuse. Male spikelets rather numerous, terminal and sessile along the slender branches of a loose panicle, all erect, shining brown, ovate or oblong, about 3 lines long. Glumes lanceolate, acutely acuminate. Perianth-segments 6, all narrow, 2 outer ones concave, the third and the 3 inner ones flat. Anthers shortly exserted. Females unknown.

W. Australia, *Drummond, n.* 68 and 71. The habit is nearly that of the eastern *R. gracilis.*

13. **R. chaunocoleus,** *F. Muell. Fragm.* viii. 64.—Rhizome thick, shortly creeping, densely covered with a whitish wool not concealed by scales. Stems erect, simple, slender but rigid, terete, glabrous, often above 2 ft. high. Sheathing scales narrow but loose above the middle, acute and often produced into a fine point. Male spikelets numerous, in a terminal interrupted spike, either simple or with short erect branches, all sessile and erect or with a pedunculate one in the same bract, each spikelet about 2 lines long, containing but few flowers. Glumes ovate-lanceolate with a fine point very short on the inner ones, 2 or 3 outer glumes empty. Perianth-segments 5 or 6, 2 or 3 outer ones very narrow-linear, rigid, concave or complicate, 3 inner linear-lanceolate flat and very thin. Female spikelets much fewer, narrow,

4 to 5 lines long, containing usually only 2 or 3 flowers, with several empty glumes. Perianth often 2 lines long, the 2 outer segments complicate with the dorsal keel dilated upwards into a scarious jagged or ciliate wing as in *Leptocarpus tenax*, 3 inner segments lanceolate flat and thin. Staminodia 3. Ovary broad flat, retuse, 2-celled; styles united at the base, stigmatic in the upper half only. Capsule flat, thick, emarginate, about 1½ lines long and broad, opening at the edges.

W. Australia, *Drummond 1st coll. and n.* 948 (♂) *and* 949 (♀).

14. **R. australis,** *R. Br. Prod.* 245.—Rhizome creeping, woolly-hairy. Stems erect, undivided, 1 to 2 ft. high or rarely more. Lower sheathing scales closely appressed, about ½ in. long, the upper ones longer and looser, all obtuse; floral bracts broader looser and rather acute, the lower ones sometimes 1 in. long, the upper ones much shorter. Spikelets in both sexes few at the end of the stem, solitary and sessile or nearly so within the bracts, or 2 within the lower bract one on a short pedicel; all ovoid, 4 or 5 lines long. Glumes lanceolate, acuminate with a fine point, rather spreading. Male flowers: Perianth about 1 line long, 2 outer segments narrow, complicate, the third flat or sometimes deficient, 3 inner ones flat but narrow, obtuse. Stamens shortly exserted. Female spikelets usually rather longer than the male. Perianth-segments 4 or 6. Staminodia 2 or 3. Ovary 2-celled. Capsule opening on the edges.—F. Muell. Fragm. viii. 69; Hook. f. Fl. Tasm. ii. 71.

N. S. Wales. Port Jackson, *Sieber*, *n*. 33.
Victoria. Cobberas Mountains, *F. Mueller*.
Tasmania. Derwent River, *R. Brown*; abundant on the mountains in marshy places, *J. D. Hooker* and others.

15. **R. gracilis,** *R. Br. Prod.* 245.—Very nearly allied to *R. australis;* differing chiefly in the more slender stems, the sheathing scales more closely appressed and the more numerous smaller spikelets forming an interrupted more or less compound spike or narrow panicle of 2 to 4 in. Floral bracts acuminate with a fine point Male spikelets rather broad, varying from 2½ to 3½ lines long, nearly sessile or almost all on pedicels as long as or longer than the bracts. Perianth-segments 6, the 2 outer ones complicate as in *R. australis*. Female spikelets longer and more sessile, very narrow in Brown's specimens, broader in others. Flowers 2-merous as in *R australis* but no staminodia.—F. Muell. Fragm. viii. 69; *R. pallens*, R. Br. Prod. 245.

Queensland. Moreton Island, *F. Mueller*; Brisbane, *Prentice*.
N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *F. Mueller* and others; New England, *C. Stuart*; Tweed River, *Guilfoyle*; Richmond River, *Mrs. Hodgkinson*.
Tasmania. Recherche Bay, *C. Stuart*.

The majority of our male specimens, especially those with the smaller heads, correspond with Brown's of *R. pallens* which are all males. Brown's specimens of *R. gracilis* are all females, with rather long narrow spikelets. Our female specimens are very few, with shorter and more crowded spikelets than in Brown's, but they are either more advanced or in an imperfect state.

16. **R. complanatus,** *R. Br. Prod.* 245.—Rhizome short and thick with little or no wool. Stems densely tufted, erect, simple, much flattened. Sheathing scales appressed, obtuse, rather thin, ½ to ¾ in. long. Male spikelets rather numerous, in a narrow panicle, on filiform pedicels, narrow-ovate, scarcely 3 lines long. Glumes shortly acuminate, slightly ciliate, the midrib produced into a fine point, one or two outer ones short and empty. Perianth often shortly stipitate within the glume, segments 4, narrow. Stamens 2. Female spikelets usually fewer and narrower than the males and sometimes longer, the glumes rather distant. Ovary sessile, 2-merous. Capsule scarcely dehiscent.—Hook. f. Fl. Tasm. ii. 71; F. Muell. Fragm. viii. 67.

Queensland. Brisbane River, *Bailey.*

N. S. Wales. Port Jackson, *R. Brown, Sieber, n.* 8 and many others; northward to Hastings River, *Beckler*; southward to Twofold Bay, *F. Mueller.*

Victoria. Lawrence River, *Robertson;* Mount Abrupt and Grampians, *F. Mueller;* Mount William, *Sullivan.*

Tasmania. Derwent River, *R. Brown;* about Circular Head and George Town, *Gunn;* Southport, *C. Stuart.*

17. **R. tetraphyllus,** *Labill. Pl. Nov. Holl.* ii. 77. *t.* 226, 227. Rhizome thick, densely woolly-hairy under the short broad scales. Stems erect, 2 or 3 ft. high, usually bearing filiform dichotomous branches, either short and dense or longer and loose, clustered within the erect appressed sheathing scales. Spikelets in both sexes usually rather numerous, pedicellate in a narrow loose panicle. Male spikelets from narrow ovate to nearly globular, 2 to 3 lines long. Glumes acuminate, with short fine points. Perianth-segments 6, 2 outer rather broad and complicate, the third narrow, 3 inner flat and hyaline, 1 broad and 2 narrow. Female spikelets usually longer and narrower, the glumes more acuminate. Perianth-segments 4, 2 outer ones complicate and lanceolate, 2 inner broader and flat but with the margins folded in. Capsule small, flat, not usually opening at the margins but the thin sides bursting irregularly.—R. Br. Prod. 247; Hook. f. Fl. Tasm. ii. 71; F. Muell. Fragm. viii. 66.

Queensland. Brisbane River, *Leichhardt, Bailey;* Wide Bay, *Sheridan;* Rockhampton, *Thozet.*

N. S. Wales. Port Jackson, *R. Brown, Sieber n.* 34 and others; northward to Clarence and Hastings Rivers, *Beckler, Wilcox;* New England, *C. Stuart;* Richmond River, *Mrs. Hodgkinson.*

Victoria. Portland, *Allitt;* Tarwin River, Gipps' Land, *F. Mueller.*

Tasmania, *Labillardière;* Huon River, *R. Brown;* abundant throughout the island forming large tufts, *J. D. Hooker.*

There appear to be two varieties both among the N. S. Wales and the southern specimens, one with large ovate the other with small nearly globular spikelets. According to F. Mueller the capsules in the latter variety open at the edges, but I have not myself succeeded in finding any such.

18. **R. laxus,** *R. Br. Prod.* 245 (*n.* 3).—Rhizome creeping. Stems rather slender, terete, erect or flexuose, simple or slightly branched. Sheathing scales loose, dilated and spreading above the middle, very obtuse and quite glabrous. Spikelets few, sometimes only 1 or 2, the

males shortly pedicellate, the females more sessile, ovate, of a bright brown, 4 to 5 lines long. Glumes acute with a fine point, one or two outer ones in the males, several in the females empty. Perianth-segments 5 or 6, narrow, thin, mostly acuminate. Ovary 2-merous in the spikelet examined by F. Mueller, 3-merous according to R. Brown. —*R. chasmatocoleus*, F. Muell. Fragm. viii. 71.

W. Australia. King George's Sound and Lucky Bay, *R. Brown;* Toovey, *Maxwell;* Tone River, *Oldfield.*

I have only been able very imperfectly to examine the female spikelets, but on comparison F. Mueller's and R. Brown's species are evidently identical.

19. **R. ornatus,** *Steud. Syn. Glum.* ii. 256.—Rhizome slender, creeping. Stems slender, erect or slightly flexuose, mostly about 1 ft. high or rather more, simple or with few erect branches, or occasionally clusters of short sterile compound branchlets from the lower sheaths. Sheathing scales spreading from near the base, very obtuse, bordered by long white woolly hairs, and the lower part of the stem with loose cottony hairs at length wearing off. Spikelets few; males broadly ovate, 3 to 4 lines long, pendulous on short filiform pedicels. Glumes ovate or ovate-lanceolate, striate, with fine rigid points. Perianth-segments 6, narrow, acute but not acuminate. Female spikelets much narrower and erect, the flowers fewer, the glumes similarly awned. Perianth the same. Staminodia 3. Ovary 2-celled or very rarely 3-celled. Capsule hard, about 1 line broad, opening at the angles.—*R. confinis*, Steud. l. c.; *R. Steudelii*, F. Muell. Fragm. viii. 70.

W. Australia, *Drummond, n.* 339 (♂) *and* 324 *and* 340 (♀).

20. **R. leptocarpoides,** *Benth.*—Rhizome densely tufted, scarcely creeping, woolly with reddish brown hairs. Stems slender, erect or flexuose, 1 to 1½ ft. high in the typical form, simple or sparingly branched. Sheathing scales narrow, erect, appressed, tapering into a fine erect point. Male plant: Floral bracts narrow, erect and acuminate like the stem-scales. Spikelets 6 to 12, spreading or pendulous on unequal clustered filiform pedicels, of a shining brown, 4 to 5 lines long. Glumes lanceolate, very acute, not closely imbricate, above 2 lines long, 1 or rarely 2 at the base empty. Perianth-segments 5, 2 outer ones very narrow concave and very acute, 3 inner rather broader, flat, hyaline and less acute. Filaments very short. Female floral bracts broader and more open. Spikelets few, erect, sessile or on short rigid erect pedicels, ovoid, 3 to 4 lines long. Glumes broad, rigid, with short points. Perianth-segments 5, 2 outer ones rather broad, acute, complicate with a prominent woolly-ciliate dorsal keel often slightly winged, 3 inner flat, lanceolate, hyaline, scarcely acute. Staminodia 3. Ovary flat, 2-celled. Styles connate at the base. Capsule broad, emarginate, opening at the edges.—*R. deformis*, Nees in herb. Lindl.; F. Muell. Fragm. viii. 65, not of R. Br.

W. Australia. King George's Sound, *Collie*, Kalgan River, *Oldfield;* Busselton, *Preiss;* Swan River, *Drummond 1st coll. and n.* 907, also 188, 381 (♂) and 369 (♀).

The inflorescence and general habit nearly resemble those of *Leptocarpus aristatus*, but the female flowers are very different.

Var.? *monostachya*, F. Muell. Stature smaller and the female stems always ending in a single spikelet.—Stirling Range, *F. Mueller*.

21. **R. amblycoleus**, *F. Muell. Fragm.* viii. 65.—Rhizome apparently shortly creeping, the woolly hairs not very copious. Stems erect, rigid, terete, simple, 1 to 2 ft. high. Sheathing scales rigid, closely appressed, obtuse. Floral bracts shorter and looser at the end. Male spikelets few in the upper part of the stem, on short slender pedicels, either solitary or 2 or 3 on the lowest peduncle, all narrow-ovate, 4 to 6 lines long. Glumes imbricate, with fine slightly spreading points. Perianth-segments 6, all linear, 2 outer ones concave, the 3rd and 3 inner ones flat. Anthers shortly exserted. Female spikelets about as many as the males, but larger, erect, and sessile or on short rigid pedicels. Glumes rigid with spreading points. Capsules round flat and 2-celled (*F. Mueller*), all fallen away from our specimens.

W. Australia, *Drummond, n.* (66 or 99).

22. **R. tremulus**, *R. Br. Prod.* 245.—Stems flattened, the flowering ones erect, rigid, simple, 2 to 3 ft. high, barren ones short or slender, with flexuose branches. Sheathing scales closely appressed, rigid, striate, the lower ones usually shortly plumose-ciliate at the end, and often bearing a short obtuse erect lamina. Floral bracts short and closely appressed, distant from each other. Male spikelets on capillary pedicels of ½ to 1 in., clustered several together from each bract, all broadly ovate or almost globular, about 3 lines diameter, brown and shining. Glumes ovate or ovate-lanceolate, obtuse or scarcely acute, about 1½ lines long, very numerous with a few smaller outer ones empty. Perianth-segments 6, all narrow and nearly equal. 2 outer ones concave, the others flat. Filaments slender but short. Female inflorescence more compact, the spikelets narrower, all erect, the pedicels rigid and often branched, especially the lower ones, Glumes shortly ciliate. Ovary 2-celled; styles free from the base, long and slender, spirally involute in the bud. Capsule obcordate, rather hard, opening on the edges.—F. Muell. Fragm. viii. 70; *R. brizoides*, Steud. Syn. Glum. ii. 255.

W. Australia. King George's Sound or adjoining districts, *R. Brown, Harvey, Maxwell* and others; Perongerup, *F. Mueller*; Swan River, *Miss Lukin*; also *Drummond, n.* 342 (♂) and 343 (♀).

6. LEPTOCARPUS, R. Br.

Flowers diœcious, both sexes in spikelets with imbricate glumes without bracteoles, or the females in compound spikelets with bracteoles. Perianth-segments 6 or fewer by abortion, variously shaped. Male flowers: Stamens 3 or rarely 2; filaments filiform, free, usually very short; anthers 1-celled. Rudimentary ovary small or none.

Female flowers: Staminodia 3 or none. Ovary 1-celled, with 1 pendulous ovule; styles 3 (rarely 2?), filiform, free or united to near the middle, the free part stigmatic from near the base. Fruit narrow or ovoid, with a thin pericarp opening on one side, or with a thicker pericarp splitting at the angles. Stems simple or branched, leafless except the sheathing scales which are usually closely appressed and erect. Male and female inflorescences nearly similar or very different, in some species the spikelets of both sexes in narrow panicles, in others the males pedicellate and paniculate, the females sessile and clustered or spicate. Male spikelets always several-flowered with 1, 2 or rarely 3 outer empty glumes. Females various.

The genus like *Restio* is also represented in South Africa, and there is one species in New Zealand, but the Australian ones appear to be all endemic. The males of some species are scarcely to be distinguished from those of some species of *Restio*, but the females are readily recognised.

Sect. I. **Diplanthesis.**—*Male spikelets on filiform pedicels, paniculate or clustered, mostly pendulous. Females sessile, in heads spikes or dense panicles.*

Female spikelets regularly imbricate without bracteoles.
Male spikelets numerous in a terminal panicle.
Female perianth-segments 6, all narrow and acuminate. Spikelets densely paniculate. Glumes with scarious margins . . . . 1. *L. scariosus.*
Female perianth-segments 5, 2 outer ones complicate with a very prominent usually winged keel. Spikelets few or rarely in a dense panicle . . . . 2. *L. tenax.*
Female spikelets irregularly compound though dense, with bracteoles under each flower. Male spikelets few or in distant clusters.
Female perianth-segments nearly equal or gradually passing from the outer larger to the inner smaller ones.
Male spikelets few. Females in a compact short spike-like panicle. Eastern species . . . . . 3. *L. Brownii.*
Male spikelets in distant loose clusters. Western species.
Female spikelets small in distant clusters . . . . 4. *L. canus.*
Female spikelets very small along the slender spike-like branches of a narrow panicle . . . . . 5. *L. coangustatus.*
Female perianths of 3 outer long rigid subulate segments and 3 small oblong inner ones closed over the ovary and base of the style. Western species.
Female spikelets in oblong clusters. Perianths ciliate at the base but the hairs not showing outwards . 6. *L. aristatus.*
Female spikelets in dense heads. Perianths woolly-ciliate, the white hairs showing outwards . . . 7. *L. erianthus.*

Sect. II. **Homœanthesis.**—*Spikelets in both sexes very small, clustered along the branches of a long panicle. Tropical species.*

Spikelets very densely clustered along the short branches of a long dense panicle.
Outer female perianth-segments erect, inner short, tomentose, closed over the ovary . . . . 8. *L. ramosus.*
Perianth-segments all equal narrow, glabrous . . . . 9. *L. elatior.*
Spikelets clustered along the few narrow branches of the panicle. Perianth-segments glabrous.

Stem glabrous . . . . 10. *L. spathaceus.*
Stem cottony-villous . . . . 11. *L. Schultzii.*

SECTION I. DIPLANTHESIS.—Male spikelets on filiform pedicels, paniculate or clustered, mostly pendulous. Female spikelets sessile, in heads spikes or dense panicles.

The male plants of this section show no generic character or habit to distinguish them from the males of *Restio leptocarpoides* and allied species. The females are very different.

1. **L. scariosus,** *R. Br. Prod.* 250.—Rhizome thick tufted or creeping. Stems erect, simple or scarcely branched, terete, 2 ft. high or more. Sheathing scales closely appressed, mostly terminating in a short point and in thin hyaline scarious margins or appendages often split or jagged, but sometimes wearing away or disappearing leaving the sheath truncate; floral bracts also narrow but more acute. Male spikelets several, often very numerous, on short but filiform pedicels in a loose terminal panicle, all of a shining brown, rather narrow and nearly 3 lines long when fully out. Glumes about 1 line long, acuminate with a fine point, and often bordered by narrow scarious margins. Perianth-segments 5 (or 6?), the 2 outer ones narrow, concave, tapering to a fine point, the inner ones also fine pointed but broader flat and more hyaline. Female panicle often as large as the male but much more dense, the spikelets broader and almost sessile. Glumes, nearly 2 lines long, ovate-lanceolate, acuminate with fine points, and usually with rather broad white scarious hyaline margins, giving the panicle a variegated appearance. Rhachis of the spikelets ciliate with long hairs. Perianth-segments 6, all narrow, acute, almost hyaline and equal. Styles capillary (or short, *F. Muell.*).—F. Muell. Fragm. viii. 94; *Schœnodum scariosum*, Kunth, Enum. iii. 447.

W. Australia. King George's Sound, *R. Brown*, *Milne*, *F. Mueller* and others, and thence to Swan River, *Drummond*, 1*st coll. and n.* 946 (♂) and 944 (♀), *Oldfield.*

R. Brown described this species like the *L. tenax* and *L. aristatus* from the female specimens only, having failed to match them with their corresponding males, so very different in inflorescence that in all three cases he described them as *Restios.* Relying, however on the concurrent testimony of modern collectors, the plant sent as the male of *L. scariosus* would include *Restio cinerascens*, R. Br. Prod. 246, from King George's Sound. *R. setuligerus*, Nees in Pl. Preiss. ii. 58 (*Leptocarpus setuligerus*, F. Muell. Fragm. viii. 97) appears to me to be only a more luxuriant state of the same male with rather more numerous smaller spikelets. Some female specimens from Swan River, *Drummond*, differ slightly in their narrow spike-like panicles more scarious pale glumes and a less hairy rhachis, the rhizome is also more creeping. The variety from the Vasse River, *Pries*, mentioned by F. Mueller, Fragm. viii. 94, has large male spikelets with very broad scarious margins to the glumes and the perianth-segments are large and hyaline, but belongs most probably to the same species.

2. **L. tenax,** *R. Br. Prod.* 250.—Rhizome creeping. Stems 1½ to 3 ft. high, slender especially the males, undivided, the whole plant glabrous except sometimes a slight tomentum on the rhachis of the

inflorescence. Sheathing scales closely appressed, under ¼ in. long; floral bract under the panicle similar, the others shorter and more open. Male spikelets very numerous, in a loose panicle of 2 to 4 in., all pedicellate, ovate-oblong, about 2 lines long, of a dark brown. Glumes ovate, obtuse or with a very short point. Perianth-segments obtuse or scarcely acute, very thin, nearly equal, or 2 outer ones narrower and more pointed. Filaments very short, the anthers affixed near the base. Female spikelets few, sessile or shortly pedicellate, erect, of a rich brown, nearly cylindrical, often nearly ½ in. long, several-flowered. Glumes acutely acuminate, a few outer empty ones shorter and thin. Perianth much flattened, 2 outer segments broad, acute, complicate, the dorsal keel dilated into a wing, 3 inner ones narrow, all acute. Styles shortly connate at the base. Pericarp thin.—Hook. f. Fl. Tasm. ii. 73; F. Muell. Fragm. viii. 93; *Schœnodum tenax*, Labill. Pl. Nov. Holl. ii. 80, t. 229 as to the female plant; *Restio microstachys*, R. Br. Prod. 246, Nees in Pl. Preiss. ii. 59 (♂); *R. laxus*, n. 12, R. Br. Prod, 246; *R. diffusus*, Spreng. Syst. i. 185; *R. cinerascens*, Nees in Sieb. Pl. Exs. 41 (♂); *R. gracilis* and *R. pallens*, Nees in Sieb. Agrost. n. 47, 48 (♀) not of R. Br.; *Leptocarpus thamnocortoides*, F. Muell. Fragm. viii. 96.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, and many others; northward to Newcastle, *Leichhardt*; southward to Twofold Bay, *F. Mueller*.

Victoria. Common in heaths, Wendu Vale, *Robertson*; thence to Gipps' Land, *F. Mueller*; Mount William, *Sullivan*.

Tasmania. Derwent River, *R. Brown*; waste places throughout the island, abundant, *J. D. Hooker* and others.

W. Australia. King George's Sound, *R. Brown*, and adjoining districts, *Preiss. n.* 1709, *Drummond*, *n.* 107, 391, *Oldfield*, *F. Mueller* and others; Blackwood River, *Forrest*; Swan River, *Miss Lukin*. Some of these western specimens are precisely like the eastern ones, the females with few spikelets about ½ in. long, others have the female spikelets only 3 or 4 lines long, and rather numerous in a dense narrow panicle of about 3 in., with many intermediate states. Brown described the plant from female specimens only from his three stations and failed to recognise the male plant. Labillardière mistook for the male that of *Lyginia barbata*.

3. **L. Brownii**, *Hook. f. Fl. Tasm.* ii. 73, t. 136.—Rhizome creeping. Stems erect or flexuose, simple, rather slender, from under 1 ft. to above 2 ft. high. Sheathing scales closely appressed, short and truncate. Male spikelets on short filiform pedicels, not numerous, of a rich brown, attaining about 6 lines in length but often much shorter. Glumes loosely imbricate, acutely acuminate, nearly 2 lines long. Perianth-segments 6, 2 outer ones linear, concave, acute, 1 or 2 inner ones rather broad and flat very thin and denticulate, the others intermediate. Filaments short. Female inflorescence very compound and compact, crowded into a short spike-like panicle, sometimes 1½ in. long and interrupted at the base, sometimes reduced to a terminal head. Spikelets of 3 to 6 flowers (or 3 to 6 1-flowered spikelets) on a short common axis, but each flower within 1 or 2 bracteoles besides the subtending glume and the perianth; the floral bracts, glumes, bracteoles and perianth-segments all ovate, acutely acuminate and closely enveloping

each other, passing gradually from the very pointed floral bracts and lower glumes of 2 lines to the broad scarcely pointed inner perianth-segments of under 1 line. Style-branches 3.—F. Muell. Fragm. viii. 91; *L. simplex*, R. Br. Prod. 350 (excl. syn. Forst. and Willd.); Nees in Pl. Preiss. ii. 63; *Schœnodum simplex*, Kunth, Enum. iii. 446 as to syn. R. Br., but not the N. Zealand plant described.

Victoria. From Port Phillip to Snowy River, Gipps' Land, *F. Mueller*; Wimmera, *Dallachy*.

Tasmania. Derwent River, *R. Brown*; abundant in wet marshy places throughout the island, *J. D. Hooker*.

S. Australia. Guichen and Rivoli Bays, St. Vincent's Gulf, *F. Mueller*; Port Lincoln, *Brown*; Boston Point, *Wilhelmi*.

4. **L. canus**, *Nees. in Ann. Nat. Hist. ser.* 1. vi. 50, *and in Pl. Preiss.* ii. 64.—Rhizome woolly, knotted and horizontal or creeping. Stems slender, erect, simple or with a few long erect branches, 1 to 3 ft. high. Sheathing scales closely appressed. Spikelets clustered in the axils of distant sheathing bracts. Males on short filiform pedicels, ovate or oblong, of a shining brown, 2 to 3 lines long. Glumes ovate, acute, not closely imbricate and spreading when in flower, about 1 line long, with narrow scarious margins. Perianth-segments hyaline, usually narrow acute and shorter than the anthers, but sometimes 1 or 2 longer. Filaments very short. Female spikelets nearly sessile, 2 or 3 in the cluster, 1½ to 3 lines long, but each spikelet compound as in L. *Brownii*, each flower being within 2 or 3 bracteoles besides the short subtending glume, the rhachis ciliate. Perianth-segments 6, nearly equal, linear or linear-lanceolate, scarcely ¾ line long, closely appressed to the ovary and fruit, the densely ciliate margins giving the flower a whitish appearance. Style-branches 3. Nut small, brown, 1-seeded as in the rest of the genus, but the pericarp readily splitting into 3 valves.—F. Muell. Fragm. viii. 95; *L. ciliaris*, Nees in Pl. Preiss. ii. 64, as to the male plant.

W. Australia. Swan River, *Drummond*, *1st coll. and n.* 946 (♂) *and* 947 (♀); *Preiss. n.* 1712 (♂) *and* (1705) (♀); Gordon River, *Oldfield*; Upper Hay River, *Miss Warburton*.

5. **L. coangustatus**, *Nees in Pl. Preiss.* ii. 65.—Rhizome creeping. Stem erect, rather slender, usually divided into a few long erect branches, 1 to 3 ft. high. Sheathing scales closely appressed, mucronate, those under the branches looser. Male spikelets resembling those of *L. canus*, of a shining brown, on very short pedicels and irregularly clustered, but the clusters more branching less distant and forming more of a panicle, each spikelet 3 to 4 lines long. Glumes not closely imbricate, tapering into long fine points. Perianth-segments thin and unequal. Female spikelets small, numerous, irregularly compound, in narrow spike-like panicles of 1 to 3 in., several of these spikes usually forming a long narrow loose panicle of 6 in. to 1 ft. Flowers in the spikelet numerous on a ciliate hairy rhachis, 1 or 2 outer glumes brown acuminate and glabrous, the inner ones gradually smaller

and narrower, passing irregularly into bracteoles and perianth-segments. Styles 3, distinct.—F. Muell. Fragm. viii. 94.

W. Australia. Various localities from King George's Sound to Swan River, *Drummond*, *Preiss. n.* 1706, *Oldfield*, *Muir*, *Pries* and others. Some of the larger specimens have almost the aspect of *Lepyrodia glauca.*

6. **L. aristatus**, *R. Br. Prod.* 250.—Rhizome tufted, scarcely creeping, glabrous or nearly so. Stems slender, erect, simple, about 1 ft. high, accompanied sometimes by a few short flexuose-branched barren stems. Sheathing scales closely appressed, acute or with minute points, under ½ in. long. Male spikelets closely resembling those of *Restio leptocarpoides*, 3 to 4 lines long, on filiform clustered pedicels, spreading or pendulous. Glumes slightly spreading, acutely acuminate, almost aristate. Perianth reduced to small thin spathulate segments or sometimes entirely deficient. Filaments short. Female spikelets narrow, erect, about 4 lines long, sessile in 2 or 3 clusters at the end of the stem with sometimes 1 or 2 clusters lower down, the floral bracts short, broad, and brown. Glumes very irregularly imbricate, often 2 or 3 flowers apparently in one glume with an empty glume immediately below it. Perianth-segments 6, 3 outer ones subulate, rigid with long glabrous points or awns, densely but shortly ciliate at the base, the hairs not showing outside the closed spikelet as they do in *L. erianthus ;* 3 inner segments short, oblong, obtuse, closely appressed to the ovary and base of the style, hardening round the fruit. Style slender with 3 stigmatic branches.—*Restio nutans*, R. Br. Prod. 245 (the ♀ plant) ; *R. Brownii*, Kunth, Enum. iii. 417 ; *R. tenellus*, Nees in Pl. Preiss. ii. 57 ; *Leptocarpus tenellus*, F. Muell. Fragm. viii. 90.

W. Australia. King George's Sound, *R. Brown*, and thence to the Stirling Ranges and Swan River, *Drummond*, *1st coll. and n.* 999, *Preiss. n.* 1713, *Oldfield*, *F. Mueller*, and others.

Restio trisepalus, Nees in Pl. Preiss. ii. 58, described from a male specimen of Preiss's, which I have not seen, belongs most probably to this species.

7. **L. erianthus**, *Benth.*—Very closely allied to *L. aristatus* with the same habit and inflorescence, but the rhizome usually woolly, the stems not quite so slender and all simple in the specimens seen. Male spikelets spreading on pendulous or filiform clustered pedicels, narrow, 3 to 4 lines long. Glumes very broad, closely imbricate but acute or with short slightly spreading points. Perianth-segments 5 or 6, much shorter than the glumes, narrow-linear or more or less spathulate, very thin and unequal. Filaments very short. Female spikelets in dense clusters or heads, at first ovoid about 3 lines diameter and externally glabrous, when in fruit often globular, 4 to 6 lines diameter and white with the prominent hairs of the perianths. Glumes broad, irregularly imbricate as in *L. aristatus*, glabrous or ciliate. Perianth-segments 6, 3 outer ones rigidly subulate, densely hispid with long white hairs except the long fine points which are glabrous ; 3 inner segments short, oblong, obtuse, closely appressed to the ovary and style, hardened round the fruit. Style slender, divided to the middle into 3 stigmatic branches.—*L. aristatus*, F. Muell. Fragm. viii. 91, not of R. Br.

W. Australia, *Drummond*, *n.* 81 *and* 943; Albany and Stirling Range, *F. Mueller*, *Maxwell*, *Muir*; Gordon and Vasse Rivers, *Oldfield*. It is possible that this may prove to be a variety of *L. aristatus*, but the two appear to me to have been rightly distinguished by F. Mueller.

SECTION II. HOMŒANTHESIS. Spikelets in both sexes very small, clustered along the branches of a long panicle.

8. **L. ramosus**, *R. Br. Prod.* 250.—Rhizome unknown. Stems terete, erect, divided into a few long erect branches, above 2 ft. high, and sometimes the flowering branches again much divided. Sheathing scales closely appressed, shortly acute, in some specimens perhaps diseased, imbricate at the ends of the branches. Spike-like panicles dense and numerous in a long narrow interrupted panicle. Male spikelets very numerous, small and sessile in clusters along the short branches. Glumes less than a line long, acutely acuminate, almost aristate, the upper ones scarcely exceeding the lower. Perianth-segments acuminate, glabrous, the inner ones rather broader and less acuminate than the outer. The flowers examined had only 4 segments and 2 stamens in Dallachy's as well as in Fitzalan's specimens but they may very probably be sometimes 3-merous. Female inflorescence the same as the male, but the spikelets still smaller and more densely clustered. Glumes and 3 outer perianth-segments scarcely ½ line long, with fine points and glabrous or slightly ciliate, 3 inner segments shorter, obtuse, densely covered with a white woolly tomentum and closed over the glabrous ovary. Style filiform, divided to the middle into 3 or sometimes 2 stigmatic branches.—F. Muell. Fragm. viii 92.

Queensland Endeavour River, *Banks and Solander*, Rockingham Bay, *Dallachy*; Daintree River, *Fitzalan*.

9. **L. elatior**, *R. Br. Prod.* 250.—Rhizome unknown. Stems above 2 ft. high, rather stout and undivided in the specimens seen. Sheathing scales closely appressed, acuminate. Male specimens not seen. Female spikelets very small and numerous, of a rich dark brown, very densely crowded on the short branches of a long panicle, the bracts under the sessile clusters and spikelets acuminate with long fine points usually exceeding the spikelets. Spikelets about 1 line long and broad, the glumes acutely acuminate. Perianth-segments 6, under ½ line long, all nearly equal and quite glabrous or minutely ciliate. Ovary glabrous. Styles 2 or 3, free from the base or nearly so. Fruit about ½ line long, the pericarp readily splitting into 2 or 3.

N. Australia. Gulf of Carpentaria and North Coast (Arnhem's Land?) *R. Brown*. As observed in several other Restiaceæ some diseased inflorescences have larger flowers filled with the black granules of a fungus.
Queensland. Daintree River, *Fitzalan*.

10. **L. spathaceus**, *R. Br. Prod.* 250.—Rhizome unknown. Stems erect, 2 ft. high or more, divided into few rigid and erect or more numerous slender somewhat flexuose branches. Sheathing scales closely appressed, acute or shortly acuminate. Spike-like panicles

narrow and not much branched, the small spikelets numerous and clustered along the branches. Males in the specimens seen too imperfect for examination. Female spikelets ovoid, about 1 line long. Glumes acutely acuminate, rather spreading. Perianth-segments 6, narrow-lanceolate, acutely acuminate, all glabrous. Style-branches 2 or 3. Pericarp thin.—*L. desertus*, F. Muell. Fragm. viii. 93.

N. Australia. Gulf of Carpentaria, *R. Brown*; sources of the Roper River, *F. Mueller*. The majority of specimens in both instances diseased with the fungus.

11? **L. Schultzii,** *Benth.*—Rhizome shortly creeping, densely woolly, emitting numerous slender almost filiform much branched barren stems under 1 ft. high, and rigid erect simple or slightly branched flowering stems attaining 2 ft. or more, densely and softly cottony-villous as well as the rhachis of the panicle. Male spike-like panicle slender, narrow, not much branched, but only commencing flowering in our specimens, the young spikelets narrow, 1½ to 2 lines long. Glumes acuminate with scarious margins. Perianth-segments 5 or 6, the outer ones narrow and acuminate, the inner broader thinner and almost obtuse. Stamens 3. Females unknown.

N. Australia. Port Darwin, *Schultz*, *n.* 309.

7. HYPOLÆNA, R. Br.

(Calorophus, *Labill.* Calostrophus, *F. Muell.*)

Flowers diœcious, the males several together or rarely solitary, the females solitary, in spikelets with imbricate glumes and no bracteoles. Male flowers: Perianth-segments 6, narrow, glumelike or thin. Stamens 3, filaments filiform; anthers 1-celled. Female flowers: Perianth-segments (except in *H. longissima*) 6 or 4, short broad and very thin, almost hyaline. Staminodia 3 or none Ovary 1-celled, with 1 pendulous ovule; styles or style branches 2 or 3, filiform, stigmatic from below the middle, Fruit a small ovoid or obovoid indehiscent nut.—Stems usually much-branched and often flexuose, leafless except the sheathing scales which are persistent. Male spikelets either solitary or 2 together within distant bracts along the branches, or several in a terminal panicle. Females solitary or 2 or 3 together at the end of the branches.

Besides the Australian species of which one is also in New Zealand, there are several from South Africa.

Sect. I. Calorophus. *Male spikelets solitary or 2 together, 1 sessile, the other shortly pedicellate, within distant floral bracts.*

Male spikelets 1-flowered . . . . 1. *H. longissima.*
Male spikelets several-flowered.
  Female spikelets terminal or sessile, 2 to 3 lines long.
    Eastern species . . . . 2. *H. lateriflora.*
  Female spikelets pedicellate, 1 line long. Western
    species . . . . 3. *H. gracillima.*

Sect. II. Euhypolæna. *Male spikelets all pedicellate in a small panicle. Female spikelets terminal solitary or in clusters of 2 or 3.*

Style-branches longer than the entire part. Eastern species. 4. *H. fastigiata*.
Style-branches shorter than the entire part. Western species. 5. *H. exsulca*.

Section I. Calorophus. Male spikelets solitary and sessile or 2 together, one sessile the other pedicellate, within distant floral bracts, as in *Restio deformis* and its allies. Female spikelets solitary or few.

1. **H. longissima,** *Benth.* Stems slender, much-branched, flexuose or twining, "often climbing to the height of several yards," the whole plant quite glabrous. Sheathing scales appressed, often dark-coloured, the lower ones about ½ in. long and obtuse or with deciduous points, the upper ones and floral bracts gradually smaller, with short fine reflexed points or subulate laminæ. Male spikelets usually 2 together within the distant bracts. Glumes 2, shorter than the solitary flower. Perianth-segments lanceolate, with a small usually inflexed point, the 3 inner ones about 1½ lines long, the 3 outer shorter. Stamens 3 round a rudimentary ovary. Female spikelets solitary and terminal or on long peduncles, 1-flowered like the males. Glumes few, acuminate. Perianth of 6 or sometimes 4 nearly equal lanceolate acuminate segments nearly 2 lines long. Receptacle thick. Staminodia 3 or sometimes 2, rigid and persistent. Style branches 3 or 2. Nut hard, ovoid, about 1 line long.—*Calorophus elongatus*, Labill. Pl. Nov. Holl. ii. 78 partly; *Calostrophus elongatus*, F. Muell. Fragm. viii. 86.

Tasmania, (*Labillardière*); foot of Mount Lapeyrouse, *C. Stuart.* Labillardière's description is evidently taken partly from this, although chiefly from the following species which he figures.

2. **H. lateriflora,** *Benth.*—Stems slender, very much branched and flexuose, sometimes nearly erect and under 1 ft., sometimes climbing to the height of 4 or 5 ft. Sheathing scales closely appressed, the upper ones as well as the floral bracts or sometimes nearly all with short subulate reflexed tips or filiform laminæ. Male spikelets usually 2 together within the distant floral bracts along the branches, one sessile the other shortly pedicellate, few flowered with 1 or rarely 2 empty glumes. Glumes thin, acute or acuminate, often slightly woolly-ciliate. Perianth-segments 6, narrow, nearly equal, the outer ones more acute than the inner. No rudiment of the ovary. Female spikelets 2 to 3 lines long, solitary within the 1, 2 or rarely 3 uppermost bracts. Glumes few, lanceolate, acutely acuminate, rigid, about 1½ lines long. Perianth of 6 or 4 broadly ovate very thin and hyaline segments, the inner ones scarcely longer than the ovary, the outer gradually rather larger. Styles 3 or 2, distinct from the base. Nut ovoid-globular, sessile on a thick receptacle.—*Restio lateriflorus*, R. Br. Prod. 247; *Calostrophus lateriflorus*, F. Muell. Fragm. viii. 87; *Calorophus elongatus*, Labill. Pl. Nov. Holl. ii. 78. t. 228, partly; Hook. f. Fl. Tasm. ii. 75; *Lepyrodia elongata*, Spreng. Syst. Cur. Post. 36; *Leptocarpus squarrosus* and *Restio crispatus*, Nees in Sieb. Agrost. n. 38, 39.

Queensland. Moreton Island, *F. Mueller*; Moreton Bay, *Leichhardt*; Brisbane River, *Bailey*.

N. S. Wales. Port Jackson, *R. Brown*; barren spots in the interior, *A. Cunningham*; New England, *C. Stuart*.

Victoria. From Brighton to Gipps' Land and ascending the Australian Alps to 6000 ft. *F. Mueller*; Mount William, *Sullivan*.

Tasmania. Table Mountain (Mount Wellington), *R. Brown*; abundant throughout the island *J. D. Hooker*.

Also in New Zealand.

After F. Mueller I have preferred Brown's specific name to Labillardière's, as the latter appears from his description to have confounded the preceding and the present species under one name.

3. **H. gracillima,** *Benth.*—Stems much-branched, more slender and intricate than in *H. lateriflora*, and attaining according to Oldfield 5 or 6 yards, though usually much smaller. Lower sheathing scales appressed, the upper ones and floral bracts loose, with a short fine reflexed point or lamina. Male spikelets usually 2 together within the distant floral bracts as in *H. lateriflora*, one sessile the other pedicellate, several-flowered, narrow-ovate, 2 to 3 lines long. Outer empty glumes 1 or 2, rather rigid, with a rigid dorsal point; flowering ones very thinly scarious but with a prominent dorsal point, the margins slightly 2-lobed at the top. Perianth-segments narrow, scarious, obtuse, the outer ones 1¼ lines long, the inner rather shorter. Female plant still more slender. Spikelets scarcely above 1 line long, on recurved pedicels projecting 1 or 2 lines beyond the floral bract. Glumes about 3. Perianth-segments 6, very thin and hyaline, broad and rather longer than the ovary. Styles 3 or sometimes 2, distinct, recurved.—*Calostrophus gracillimus*, F. Muell. Fragm. viii. 88; *Calorophus elongatus*, Nees in Pl. Preiss. ii. 68 as to the western plant only, not of Labill.

W. Australia. King George's Sound and neighbouring districts, *Preiss*, *n.* 1711, 1714, *Drummond*, *Oldfield*, *F. Mueller* and others, and perhaps the same species, Murchison River, *Oldfield*.

The male plant is not unlike the slender specimens of that of *H. lateriflora*, but the female (if correctly matched which I believe it to be) is very different, most remarkable for its minute pedicellate spikelets.

SECTION II. EUHYPOLÆNA. Male spikelets all pedicellate in a small panicle as in *Restio leptocarpoides* and several species of *Leptocarpus*. Female spikelets terminal, solitary or in clusters of 2 or 3.

4. **H. fastigiata,** *R. Br. Prod.* 251.—Stems much-branched, rather slender, erect or ascending and flexuose, from under 1 ft. to near 2 ft. high, glabrous or with a short loose white tomentum especially in the inflorescence. Sheathing scales dark-coloured, appressed, mostly with a short erect point. Male spikelets all pedicellate in a terminal panicle, oblong-linear or at length narrow-ovate, about 3 lines long or rather more when fully out. Glumes of a rich brown, rather broad with a short point, a few lower ones empty. Perianth-segments 6, 2 outer ones complicate and acutely keeled, the third lanceolate flat and

rather acute, the 3 inner rather shorter and more obtuse. Anthers almost sessile, dorsally attached very near the base to the very short filament. Female spikelets solitary and terminal or rarely 2 or 3 clustered together, 2 to 3 lines long. Glumes much more acuminate than in the males. Perianth-segments 6, thinly scarious, very broad and only about as long as the ovary. Styles shortly connate at the base. Nut hard, sessile on a thickened receptacle.—Hook. f. Fl. Tasm. ii. 74, t. 137; F. Muell. Fragm. viii. 84; *Restio clavatus*, R. Br. Prod. 246.

N. S. Wales, Port Jackson, *R. Brown* and many others.

Victoria. Glenelg River, *Robertson*, Port Phillip and neighbourhood, *F. Mueller* and many others; Grampians, *Sullivan*.

Tasmania, *R. Brown;* abundant in sandy places where wet in winter, *J. D. Hooker* and others.

S. Australia. Guichen Bay and Encounter Bay, *F. Mueller.*

5. **H. exsulca**, *R. Br. Prod.* 251.—Male plant closely resembling *H. fastigiata*, the stems usually less branched and the much-branched barren ones rare, the white cotton of the inflorescence very scanty or none, the spikelets rather broader, the perianth and stamens the same. Female plant more rigid with flexuose branches. Spikelets either solitary and terminal or more frequently 2 or sometimes 3 together near the ends of the branches, each 4 to 6 lines long. Glumes lanceolate with long points, at first of a bright brown, but when fully out more rigid and as the fruit ripens the outer ones becoming white. Perianth-segments broad and thin scarcely exceeding the ovary and shorter than the fruit. Style elongated, the 3 branches shorter than the entire part. Nut ovoid, hard, on a thick receptacle as in other species.—Nees in Pl. Preiss. ii. 69 (♀); *H. fastigiata*, Nees, l. c. (also ♀); *H. Esenbeckii*, F. Muell. Fragm. viii. 86; *Restio clavatus*, Nees, l.c. 58 (♂), not of R. Br.; *H. grandiuscula*, F. Muell. Fragm. viii. 85 (spikelets brown but young); *Restio vacillans*, Steud. Syn. Glum. ii. 255.

W. Australia. King George's Sound, *R. Brown*, *A. Cunningham*, *F. Mueller* and others and thence to Swan River, *Drummond 1st coll. and n.* 337 (♂) and 338 (♀) *Preiss, n.* 1703, 1783 and others.

In Brown's Prodromus the letters J. M. D. are, probably by some clerical error, affixed both to *H. fastigiata* and *H. exsulca*, which he seems at one time to have regarded as one species, but his herbarium as well as his diagnosis clearly show that he meant to apply the former name to the eastern, the latter to the western plant. In all the flowers I have examined the difference in the style independently of other characters has appeared constant.

8. LOXOCARYA, R. Br.

Flowers diciœous or monœcious, the males several together the females solitary, in spikelets with imbricate glumes and no bracteoles. Male flowers: Perianth-segments 6, glume-like or thin and almost hyaline, filaments filiform or flattened, anthers 1-celled. No rudiment of the ovary or rarely a small one in the terminal flower. Female flowers: No staminodia. Perianth of 3, 4 or 6 short broad very thin segments or none. Ovary 1-celled with 1 pendulous ovule. Style simple, filiform, stigmatic from below the middle. Fruit a small ovoid or obovoid usually hard nut, indehiscent except in *L. cinerea.*—Stems usually much branched and often flexuose, the branches often densely clustered, the sheathing scales persistent. Male spikelets either terminal or 2 or 3 distant along the branches and sessile; females, solitary and terminal.

The genus is limited to West Australia.

Female perianth-segments 3 or 4 (where known).
  Flowering branches long and slender.
    Glabrous . . . . 1. *L. densa.*
    Softly villous . . . . 2. *L. vestita.*
  Flowering branches short and clustered.
    Stems above 1 ft. Male spikelets 1 or 2 sessile on the branch besides the terminal one. Females on the same specimen . . . . 3. *L. virgata.*
    Stems under 1 ft. Male spikelets solitary on the filiform branches appearing lateral from the bract continuing the branch, or few in very irregular dichotomous cymes . . . . 4. *L. pubescens.*
Female flowers without any perianth within the enclosing glumes.
  Spikelets solitary on peduncles densely clustered with leaf-like barren branches . . . . 5. *L. fasciculata.*
  Flowering branches elongated, flexuose, with distant sessile spikelets.
    Stems glabrous or with very few scattered hairs . . . 6. *L. flexuosa.*
    Stems more or less scabrous-pubescent. Nut dehiscent . 7. *L. cinerea.*

1. **L. densa,** *Benth.*—Stems quite glabrous, considerably above 1 ft. high, with numerous long slender flexuose branches tuberculate-scabrous. Sheathing scales rigid, appressed, $\frac{1}{2}$ to $\frac{3}{4}$ in. long. Male spikelets usually several, sessile and distant at the ends of the branches, very narrow and erect, about 3 lines long. Glumes brown, 1 or 2 outer ones empty with long points, the flowering ones few, with short points. Perianth-segments broadly linear, with dark centres and scarious margins, 2 outer ones concave, the 3rd and 3 inner ones flat. Filaments flattened. Female spikelets 1 or 2 only at the ends of the branches, very narrow, about 4 lines long. Glumes usually about 4, the outer ones with long the inner with short points. Perianth-segments 4, 2 outer ones about 2 lines long, broad and very obtuse, very thin but slightly coloured, 2 inner ones much shorter and broader and quite hyaline. Style undivided, with a long thick stigmatic portion.—*Calorophus densus,* Nees. in Pl. Preiss. ii. 67.

W. Australia. Swan River, *Drummond,* 1*st coll.* (♂); King George's Sound, *Muir* (♀).

2. **L. vestita,** *Benth.*—Stems 6 to 10 in. high, paniculately branched and very flexuose like *L. densa,* but softly villous with whitish hairs. Sheathing scales appressed. Male spikelets solitary,

terminating the slender branches or rarely a second one lower down, very narrow and erect, about 2 lines long. Glumes 2 outer empty shorter than the others, broad and acuminate with short fine points, 3 or 4 flowering ones with involute scarious margins. Perianth-segments 6. Females unknown.

W. Australia, *Drummond, n.* 388.

3. **L. virgata,** *Benth.*—Stems erect, 1 to 1½ ft. high, loosely and shortly pubescent. Sheathing scales broad and open, 2 or 3 of the lower ones empty, the others enclosing dense clusters of short slender straight or very flexuose branches, most of them flowering. Male spikelets usually 2 or 3 on the branch, terminal or sessile and distant within lanceolate acuminate bracts, each spikelet ovate, scarcely 2 lines long. Flowers rather numerous. Glumes acute, about 1 line long. Perianth-segments 6, very narrow, hyaline, unequal. Female spikelets solitary on some of the branches of the lower clusters in specimens otherwise male, narrow, acuminate, 2½ to 3 lines long. Glumes few, the outer ones shorter with slightly spreading points, the inner ones less pointed, all closely enveloping each other and the solitary terminal flower. Perianth-segments 3, very narrow, thin and hyaline. Ovary of the genus but the styles fallen away from our specimens.

W. Australia, *Drummond, n.* 74 *and* 113. Another 113 however of the same collector appears to be the male of some *Hypolæna.*

4. **L. pubescens,** *Benth.*—Stems glabrous or loosely pubescent with spreading hairs, under 1 ft. high; branches numerous, flexuose but almost filiform, irregularly clustered but not so dense nor so short as in *L. fasciculata.* Sheathing scales rather broad, but appressed, often produced into linear points or laminæ. Male spikelets numerous but solitary and terminal or apparently lateral, the branch being continued by a subulate bract, or sometimes few in an irregularly dichotomous cyme, all small, broadly ovoid, about 2 lines long, many-flowered. Glumes broad, scarcely pointed, brown with scarious margins, a few outer ones shorter more pointed and empty. Perianth-segments narrow and hyaline, or 2 outer ones rather longer and slightly coloured. Female spikelets 1 or 2 on the branch, sessile, narrow, 3 to 4 lines long. Glumes few, the outer ones short with long points, often ciliate, the inner ones long and narrow, acuminate, dark brown. Perianth-segments 6, very thin and hyaline, broad, very obtuse or truncate, shorter than the ovary, withering away from the ripe nut.—*Restio pubescens,* R. Br. Prod. 247; *Hypolæna pubescens,* Nees. in Pl. Preiss. ii. 69, partly.

W. Australia. King George's Sound, *R. Brown, F. Mueller, Preiss,* n. 1720; Busselton, *Preiss.*

5. **L. fasciculata,** *Benth.*—Stems erect, 6 to 8 in. high in the specimens seen but probably sometimes longer, sprinkled as well as the

branches with a few long hairs. Sheathing scales broad, mostly aristate, all or nearly all enclosing a dense cluster of short leaf-like triquetrous branches not above 1 in. long. Male peduncles mixed with the branches and about as long, each bearing a single oblong spikelet of about 2 lines, containing 2 to 5 flowers and usually 1 empty glume. Glumes rigidly scarious, glabrous or slightly ciliate, obtuse or with a short fine point. Perianth-segments narrow, almost hyaline. Anthers exserted. The rudimentary ovary often present. Female spikelets several, sessile or nearly so in the cluster of branches, consisting of 4 or 5 hard narrow acuminate glumes closely enveloping each other and the single terminal flower. The outer glume about 3 lines long including the rigid point, the inner ones with shorter points, the innermost almost obtuse. Perianth of 6 very thin membranous appressed orbicular segments, or sometimes none? Style long, undivided, stigmatic from near the base. Nut with a thick callous apex.—*Restio fasciculatus*, R. Br. Prod. 247; *Desmocladus Brunonianus*, Nees in Pl. Preiss. ii. 56; F. Muell. Fragm. viii. 98.

W. Australia. King George's Sound and adjoining districts, *R. Brown*, *Preiss*, *n.* 1723, *F. Mueller*, *Oldfield*.

Drummond's specimens, n. 356, referred here, may possibly be diseased females. The stems are taller, the clustered simple branches short, the numerous sessile spikelets only 1 to 1½ lines long, glumes very obtuse, completely enveloping the small ovary, containing a deformed ovule and mucronate by a short rudiment of a style.

6. **L. flexuosa**, *Benth.*—Stems glabrous or loosely sprinkled with a few hairs, mostly under 1 ft. high, with numerous flexuose rather long branches. Sheathing scales appressed in the lower part of the stem, broader and looser or worn away under the branches. Male spikelets several, sessile and distant along the branches, scarcely 2 lines long at first, narrow-ovate when fully out, many-flowered. Perianth-segments 6, narrow. Female spikelets 1 or 2 to each branch, very narrow, rather above 2 lines long when fully out. Glumes 2 outer ones shorter than the others with rather long points, about 4 inner ones acute or obtuse, broad but each one closely rolled round the next and the innermost round the ovary. No perianth or staminodia. Style undivided with a long stigmatic portion. Nut with a hardened apex.—*Restio flexuosus*, R. Br. Prod. 247; *Calorophus flexuosus*, Nees in Pl. Preiss. ii. 68; *C. crispatus*, Nees, l. c. 67? excl. syn. R. Br.

W. Australia. King George's Sound, *R. Brown* (♂), *A. Cunningham* and others; and thence to Swan and Murchison rivers, *Drummond*, 1*st coll. and n.* 840, *also n.* 36, *Preiss*, *n.* 1717, 1718, *Oldfield* and others; Dirk Hartog's Island, *Milner*.

The northern specimens are generally more rigid with thicker stems and branches than the southern, and the males sometimes assume the aspect of some species of *Restio* allied to *R. dimorphus*, the southern more slender ones come nearer in habit to some states of *L. pubescens*, but as far as I have ascertained the absence of the female perianth seems constant.

7. **L. cinerea**, *R. Br. Prod.* 249.—Stems under 1 ft. high with numerous flexuose rather long branches, all scabrous, dotted and often

loosely pubescent. Sheathing scales broad and loose, short or worn away under the panicle. Male spikelets usually several, sessile and distant along the branches, ovate, about 1½ lines long, many-flowered. Glumes ovate or ovate-lanceolate, acute or very shortly aristate, 1 or rarely 2 lower ones empty. Perianth-segments 6, narrow-linear, hyaline, all equal or 1 or 2 rather longer than the others. Female spikelets terminating short branches or peduncles, very narrow, about 2 lines long. Glumes few (about 5) broad and closely rolled round each other enclosing the ovary as in *L. flexuosa*, the outermost one shorter and aristate, the innermost one also short but obtuse. No perianth or staminodia. Style long, undivided, stigmatic from below the middle. Fruit at length dehiscent on one side.—*Calorophus asper*, Nees in Pl. Preiss, ii. 67; *Hypolæna pubescens*, Nees l. c. 69, partly.

W. Australia. King George's Sound and adjoining districts, *R. Brown*, *Oldfield*, *F. Mueller* and others, and thence to Swan River, *Drummond*, *n.* 340, *Preiss*, *n.* 1694, 1716, 1721, and others, eastward to Mount Barren, Phillips and Garner Rivers, *Maxwell*.

9. LEPIDOBOLUS, Nees.

Flowers diœcious, both males and females several together, in spikelets with imbricate glumes and no bracteoles. Perianth of 5 or 6 narrow glume-like or scarious segments. Male flowers: Stamens 3; filaments filiform; anthers 1-celled. Female flowers: No staminodia. Ovary 1-celled, 1-ovulate; style simple, filiform, stigmatic from below the middle. Fruit a small indehiscent ovoid or obovoid nut.—Stems simple, erect or flexuose, the sheathing scales very deciduous leaving distant annular scars. Spikelets solitary and terminal, or in the males with 1 or few others lower down.

The genus is limited to extratropical Australia.

Rhizome creeping. Stems slender. Spikelets 1 or 2.
  Male spikelets nearly globular, about 3 lines diameter.
    Glumes scarcely ciliate, with very short joints . . 1. *L. drapetocoleus*.
  Male spikelets ovoid, ¼ to ⅓ in. long. Glumes ciliate, rounded or acute, with fine points . . . . 2. *L. Preissianus*.
Stems rather stout, densely tufted. Male spikelets 3 or 4, globular, ½ in. diameter. Glumes ciliate, rounded or truncate, with very fine points . . . . 3. *L. chætocephalus*.

1. **L. drapetocoleus**, *F. Muell. Fragm.* viii. 84.—Rhizome creeping, woolly-hairy. Stems in our specimens all simple, slender, flexuose, 1 ft. long or more, glabrous, with a few short brown sheathing scales persistent at the very base, the others all very deciduous leaving brown annular scars. Male spikelets solitary and terminal or with a second pedicellate one lower down in the axil of a deciduous floral bract, all broadly ovate, about 3 lines long. Glumes oblong, acuminate, with a short point, the outer ones broader, but very few empty. Perianth-segments scarious, about 1½ lines long, all narrow but 2 outer ones

rather broader upwards concave and ciliate, the others flat. Anthers exserted. Some specimens probably female but diseased have broader spikelets enclosing an utricle filled with the black granules of a fungus.

Victoria. Glenelg River, *Robertson*; Grampians, *F. Mueller.*
S. Australia. Onkaparinga River, *F. Mueller.*

2. **L. Preissianus,** *Nees in Pl. Preiss.* ii. 66.—Rhizome creeping, woolly-hairy. Stems about 1 ft. high, rather slender, simple, erect or flexuose, glabrous, with a few short persistent scales at the base, the rest very deciduous leaving distant scars. Male spikelets solitary and terminal or a second sessile one lower down, at first ovoid and ½ in. long but at length oblong and ¾ in. Glumes very numerous, rigidly scarious, the outer ones broad, the inner gradually narrower, almost acute and terminating in fine points. Perianth-segments 6, linear, the inner ones rather longer than the outer. Female spikelets longer and narrower. Glumes loosely imbricate especially the outer empty ones, 1 or 2 of the lowest broad, almost without points, the upper empty, ending as well as the flowering ones in long rigid points. Perianth-segments usually 5, 2 outer ones complicate and keeled, the 3 inner shorter and broader and flat. Style long, stigmatic from below the middle.—F. Muell. Fragm. viii. 83.

W. Australia. Swan River, *Drummond*, 1*st coll.*, *Preiss*, *n.* 1755; Murchison River, *Oldfield.*

3. **L. chætocephalus,** *F. Muell. Fragm.* viii. 84.—More rigid than *L. Preissianus*, the rhizome not elongated, the bases of the stems densely tufted. Male spikelets or heads 2 to 4, 1 terminal the others sessile, almost globular, ½ in. diameter when fully out. Glumes oblong or the outer ones broader, all rounded or truncate and ciliate at the end, with very fine points. Perianth-segments usually 5, narrow, scarious, nearly equal. Female spikelets much shorter than in *L. Preissianus*, with very few empty bracts. Upper flowering glumes only seen in fruit, broadly ovate, ciliate, with fine points. Nut included in the perianth, the style already fallen away.

W. Australia. Swan River, *Drummond*, 1*st coll. and n.* 954; Murchison River, *Oldfield.*

10. CHÆTANTHUS, R. Br.

(Prionosepalus, *Steud.*)

Flowers diœcious, the males unknown. Female flowers several together in short spikelets with imbricate glumes. Perianth of 3 outer linear hyaline segments, with 3 inner hair-like. No staminodia. Ovary 1-celled, 1-ovulate; style simple, stigmatic from below the middle.—Stems simple, with persistent closely appressed sheathing scales. Spikelets small, crowded in a terminal cluster.

The genus is limited to a single species, endemic in West Australia.

1. **C. leptocarpoides,** *R. Br. Prod.* 251.—Male plant unknown. Female plant: stems densely tufted, slender, undivided, about 1 ft. high. Sheathing scales narrow, closely appressed, mostly with short fine erect points. Spikelets about 1½ lines long, glabrous, of a dark brown, rather numerous but collected in a terminal ovoid branching but compact cluster 3 or 4 lines diameter and sometimes rather long. Flowers 6 to 8 or even more in the spikelet, a few outer empty glumes and the outer flowering ones dark brown and acute, the inner glumes between the pedicels very thin hyaline and narrow. Perianths on very short cylindrical pedicels on a flat receptacle, 3 outer linear segments about 1 line long, the 3 inner hair-like segments about half as long. Style scarcely exceeding the perianth. Fruit apparently an indehiscent nut, but not seen ripe.—F. Muell. Fragm. viii. 97; *Prionosepalum Gilberti,* Steud. Syn. Glum. ii. 266 (the style described as an anantherous stamen).

W. Australia, King George's Sound, *R. Brown,* and probably in the same neighbourhood, *Drummond, n.* 392; Busselton, *Pries.*

11. ONYCHOSEPALUM, Steud.

Flowers diœcious, both sexes several together in solitary terminal spikelets, with imbricate glumes. Perianth-segments in both sexes 3, very thin and hyaline, contracted into claws. Stamens 3; anthers 1-celled. Ovary stipitate, 1-ovulate, with a simple slender style, stigmatic in the upper portion. Ripe fruit unknown.—Stems simple, without sheathing scales except at the base.

The genus is limited to the single Australian species.

1. **O. laxiflorum,** *Steud. Syn. Glum.* ii. 249.—Stems from a densely branched and tufted base erect, slender, 6 to 10 in. high, undivided and without any sheathing scales except a few short imbricate ones at the base. Male spikelet many-flowered, ovate, 3 to 4 lines long, of a rather pale brown. Glumes about 1½ lines long, rather broad with a fine point, often deciduous, leaving the flower exposed. Perianth-segments linear-oblong, shorter than the glumes, contracted into distinct claws. Anthers exserted. No rudiment of the ovary. Female spikelet about the size of the male, but with rather numerous outer empty glumes broad brown and very rigid nearly 2 lines long besides a rigid point; flowering glumes also rather numerous. Perianth-segments like those of the males or narrower, with a longer more capillary claw. —F. Muell. Fragm. ix. 51.

W. Australia, *Drummond, n.* 325 (*or* 326) *and* 327. This plant has the aspect of some *Cyperaceæ,* but the single ovule is certainly pendulous and the style undivided.

ORDER CXLIII. CYPERACEÆ.

Flowers hermaphrodite or unisexual, in little green or brown spikes called *spikelets,* consisting of several scale-like bracts called *glumes,* either distichous as in *Gramineæ* or imbricated all round the rhachis, with one sessile flower in the axil of each, or the lower ones and sometimes a few at the end empty. No normal perianth (except in *Oreobolus*), but replaced in some genera by 6 or fewer, rarely more, bristles or small scales. Stamens 3 or fewer or rarely 4 to 6 or indefinite; filaments free, filiform or slightly flattened; anthers usually exserted from the spikelet, attached by their base, oblong or linear, with 2 parallel cells opening longitudinally, the connective usually more or less produced beyond the cells into a small point or appendage. Ovary entire, 1-celled, with 1 erect ovule; style terminal, filiform or variously thickened at the base, more or less deeply divided into 2 or 3 rarely more filiform spreading or recurved branches stigmatic and papillose or rarely shortly plumose from the base, and therefore often termed stigmas. Fruit a small seed-like nut, flattened when the style is 2-cleft, more or less distinctly 3-angled when it is 3-cleft. Seed erect, albuminous, with a small lens-shaped globular or ovoid embryo in its base.—Herbs often resembling in aspect the Restiaceæ or still more frequently the Gramineæ, but usually stiffer than the latter with solid or very rarely slightly hollow stems. When perennial the rhizomes often emit short stolons covered with short sheathing scales, but rarely present in dried specimens taken at the time of flowering. Leaves chiefly at the base of the stem, the outer or radical ones dilated at the base into open sheaths or reduced to sheathing scales in continuation of those of the rhizome, the inner ones as well as the stem-leaves when present embracing the stem with closed tubular sheaths, the lamina usually narrow and grass-like, and sometimes the stems quite leafless except a few sheathing scales at the base. Spikelets either solitary or clustered and terminal or apparently lateral from the subtending erect bract apparently continuing the stem, or variously collected in simple or compound spikes umbels or panicles; when umbellate irregularly so, one spikelet cluster or partial umbel being always sessile, whilst the others are supported on peduncles or *rays* of unequal length. The whole inflorescence its branches and the individual spikelets almost always subtended by bracts, the lower ones often long and resembling the stem leaves, the others gradually smaller, the inner ones and sometimes all small and glume-like.

A large Order, abundantly distributed all over the globe, but more especially in moist situations or on the edges of waters. Of the 33 Australian genera 18, many of them numerous in species, are common to the New and the Old World either tropical extra-tropical or both, 7, of which only one (*Gahnia*) has more than 10 species are limited to the Old World, but represented in Asia or in both Asia and Africa, 6 are endemic, all monotypic or of very few species, besides *Lepidosperma*, a large genus almost endemic, being represented elsewhere only by a single South Chinese species.

The delimitation of the larger hermaphrodite genera of Cyperaceæ and the distribution of their numerous species as well as of the genera themselves into well-defined groups is attended with peculiar difficulty. Although the characters separating the great typical genera *Cyperus Scirpus* and *Schœnus* are constant as to the great majority of species yet there are a few intermediate ones which have been equally well referred to the one or to the other. Some of the characters relied upon by the great cyperographers, Brown and Kunth, such as the presence or absence of hypogynous bristles, have in many instances broken down in consequence of the enormous encrease of known species since their time. Nees v. Esenbeck created some confusion by splitting up the genera upon minor characters which have proved still less constant, and that confusion has been very much encreased by Seudel's most unsatisfactory compilation. Bœckeler, in the last volumes of the Linnæa, has since rendered good service by his elaborate enumeration of the Cyperaceæ of the Berlin herbarium, but, as to the Australian species, he has generally had but single specimens often very imperfect to work upon, and appears to me to have established several upon very insufficent grounds. His long so-called diagnoses or rather ablative descriptions are useful as showing the variations species are subjected to, but, not being contrasted, give but little assistance in the practical determination of species. Another difficulty I have had to contend with proceeds from the wide range of a large portion of the Australian species, and in many cases it would require a more careful study of identical or representative species in other countries than I have been able to make, to ascertain whether those here adopted are really distinct. The order more than any other requires a careful revision on the part of a competent botanist, who could devote years to the task of carefully scrutinising the principal British and Continental herbaria.

I am indebted to Dr. Garcke, Director of the Royal Herbarium at Berlin, for the loan of all the Australian Cyperaceæ it contains which enabled me to identify those described by Bœckeler; unfortunately, however, it does not comprise those collected by Mrs. Amalia Dietrich in Queensland and described by Bœckeler in the 'Flora' for 1875, and I had overlooked this paper till after I had written out the order for press and returned Baron Mueller's collections. It seems very unlikely that Mrs. Dietrich should have found 21 new species in a part of the country so thoroughly explored by Baron Mueller's numerous correspondents, and after as careful a study as I could make of Bœckeler's complicated diagnoses, I have identified with more or less of plausibility the greater number of them. There are two which I had already described as new under other names for which I have substituted Bœckeler's, the others appear to me to be identical with or very slight varieties of published species, with the exception of a *Scleria*, about which I feel very uncertain.

TRIBE I. **Scirpeæ.**—*Spikelets solitary clustered capitate or umbellate, with several often numerous hermaphrodite flowers rarely (except in* Kyllinga*) reduced to 2 or 1. Empty glumes at the base usually only 1 or 2. Hypogynous bristles or scales when present filiform or flat.*

(Empty glumes 3 or 4 and flowers 2 or 3 in *Fimbristylis cyperoides*.)

Spikelets small in a dense simple or lobed head or short spike, with 1 rarely 2 flowers. Two inner glumes enclosing the nut and falling off with it	1. KYLLINGA.
Spikelets clustered or spicate, the clusters or spikes solitary or in simple or compound umbels. Glumes distichous. Style not bulbous. No hypogynous bristles	2. CYPERUS.
Spikelet solitary. Glumes imbricate all round. Hypogynous bristles usually present. Nut crowned by the persistent dilated base of the style	3. HELEOCHARIS.
Spikelets solitary clustered or umbellate. Glumes imbricate all round or distichous. No hypogynous bristles. Style thickened or bulbous at the base but articulate on the nut	4. FIMBRISTYLIS.
Spikelets solitary or clustered, often lateral, or in a compound umbel. Glumes imbricate all round. Style continuous with the nut. Hypogynous bristles present or not	5. SCIRPUS.
Spikelets in a terminal head or cluster. Glumes imbricate all round. Hypogynous scales 2, flat and parallel with the glume	6. LIPOCARPHA.
Spikelets clustered, the clusters usually paniculate. Glumes imbricate all round. Hopogynous scales 3, flat	7. FUIRENA.

(18. SCHŒNUS has sometimes very nearly the characters of *Cyperus*.)

TRIBE II. **Hypolytreæ.**—*Spikelets solitary clustered or paniculate, with several usually numerous flowers all hermaphrodite or some male only. Glumes imbricate all round, several of the lowest usually empty. Flowers within the glumes flat, with* 2 *complicate keeled hypogynous scales, and often flat linear ones within them.*

No flat scales within the two keeled ones. Stamens 3 or fewer. Spikelets capitate or paniculate . . . 8. HYPOLYTRUM.

Two flat scales within the 2 keeled ones. Stamens 3. Nut wholly exserted. Spikelets small paniculate . 9. EXOCARYA.

Four flat scales within the 2 keeled ones. Stamens 3. Nut included. Spikelets rather large (paniculate in the Australian species) . . . . 10. MAPANIA.

Several flat scales within the 2 keeled ones. Stamens 6. Nut large, very prominently ribbed and furrowed. Spikelets clustered in a dense panicle . . . . . 11. SCIRPODENDRON.

Numerous flat scales within the 2 keeled ones. Stamens 6 or more. Spikelet solitary, lateral.

  Spikelet ovoid, or oblong. Glumes closely imbricate concealing the inner scales . . . . 12. LEPIRONIA.

  Spikelet globular or ovoid. Glumes loosely imbricate disclosing the inner scales . . . . 13. CHORISANDRA.

TRIBE III. **Rhynchosporeæ.** *Spikelets capitate spicate or paniculate, rarely solitary or umbellate, with* 1 *rarely* 2 (*in* Schœnus 2 *to* 6) *hermaphrodite fertile flowers, and sometimes* 1 *or more male or sterile flowers above or below. Empty glumes at the base often more than* 2. *Hypogynous bristles or scales when present filiform or flat.*

(Flowers sometimes unisexual by abortion in 26 *Caustis.*)

Spikelets solitary, with 1 flower, 3 glumes, a perianth of 6 segments and 3 stamens. Dwarf leafy plant in cushion-like tufts . . . . 14. OREOBOLUS.

Spikelets small, in a dense ovoid spike or head, with 1 flower, and 4 glumes, the inner one fleshy enveloping the nut. No hypogynous bristles. Low branching leafy plant . . . . 15. REMIREA.

Glumes imbricate all round. Style-branches 2. Nut crowned by the thickened persistent base of the style.

  Empty glumes several. Hypogynous bristles 6 or irregularly fewer, slender or small . . . . . . 16. RHYNCHOSPORA.

  Empty glumes 2. Hypogynous bristles 4, long and rigid . . . . 17. CYATHOCHÆTE.

Glumes distinctly distichous. Style-branches 3, rarely 4.

  Flowers 2 to 6, all or the lower ones fertile. Rhachis between the flowers elongated curved or flexuose 18. SCHŒNUS.

  Flowers 1 or 2, both fertile or the lowest male or sterile.

    No hypogynous bristles. Spikelets in a narrow panicle or axillary . . . . 19. ELYNANTHUS.

    Hypogynous bristles or scales 3. Spikelets in a terminal head . . . . 20. MESOMELÆNA.

    Hypogynous bristles 6, long plumose and spreading under the nut . . . . 21. CARPHA.

Glumes imbricate all round, or when few obscurely distichous. Style-branches 3, rarely 4 or 8.

Hypogynous bristles small and not thickened under the nut . . . . 22. TRICOSTULARIA.
Hypogynous scales often at first minute, thickened and acuminate under the nut . . . . 23. LEPIDOSPERMA.
No hypogynous bristles or scales.
  Spikes paniculate, when 2-flowered the lowest fertile, its glumes as long as the outer empty ones. Stamens 3 . . . . 24. CLADIUM.
  Spikelets paniculate, when 2-flowered the lowest sterile; flowering glumes obtuse and shorter than the outer empty ones. Stamens 3 to 6 . . 25. GAHNIA.
  Spikelets solitary or clustered in an irregularly branched inflorescence, when 2-flowered the lowest sterile, and often unisexual. Stamens 3 to 6. Nut crowned by the ovoid or oblong base of the style . . . . 26. CAUSTIS.
  Spikelets in a small terminal head. Stamens or staminodia 6 . . . . 27. ARTHROSTYLES.
  Spikelets numerous, in a cylindrical spike enclosed in long leafy sheaths. Stamens 6 . . . . . 28. REEDIA.
  Spikelets clustered or loosely paniculate. Stamens indefinite (12 or more) . . . . 29. EVANDRA.

TRIBE IV. **Sclerieæ.**—*Flowers strictly unisexual, in unisexual or androgynous spikelets. No utricle enclosing the females. Ovary and nut seated on a disk.*

Single Australian genus . . . . 30. SCLERIA.

TRIBE V. **Cariceæ.**—*Flowers strictly unisexual, in unisexual or androgynous spikelets, the females enclosed in an utricle or perigynium.*

Spikelets solitary, androgynous. Bristle within the utricle protruding beyond it and hooked at the end 31. UNCINIA.
Spikelets solitary, spicate or paniculate; unisexual or androgynous. Bristle within the utricle not exserted nor hooked and often deficient . . . . . 32. CAREX.

TRIBE I. SCIRPEÆ.—Spikelets solitary clustered capitate or umbellate, with several often numerous hermaphrodite flowers, rarely except in *Kyllinga* reduced to 2 or 1. Empty glumes at the base usually only 1 or 2. Hypogynous bristles or scales when present filiform or flat.

1. KYLLINGA, Rottb.

Spikelets with a single apparently terminal hermaphrodite flower or with a second smaller usually male or imperfect flower immediately above it. Glumes 3 or 4, distichous, concave or navicular and keeled, of which the upper 2 closely enclosing the flower and fruit and at length falling off with it, the short stipes or rhachis of the spikelets being articulate at or above the base, the lowest glume small and empty. No hypogynous scales or bristles. Stamens 3 or fewer. Style continuous with the ovary, not thickened at the base, usually deciduous; stigmatic branches 2, filiform. Nut sessile, flat, without any hypogynous disk.—Perennials or rarely annuals with simple stems leafy at the base only. Spikelets small, very numerous, densely crowded in 1, 3 or rarely more terminal globular or oblong-cylindrical heads, sessile within an involucre of 2 to 4 unequal linear leafy bracts. When the second flower is present it is always enclosed in or subtended by a small hyaline additional glume, and, if perfect, both the nuts are enclosed in the 2 larger glumes.

The genus is widely spread over the warmer regions of the New and the Old World and the Australian species are none of them endemic, all four appear to be Asiatic and two at least also African and American, but the characters upon which Bœckeler and others have distinguished a large number of species are often very vague or trifling, and require further scrutiny before the extent of the geographical range of the principal forms can be determined. F. Mueller proposes to unite the genus with *Cyperus*, to which it is certainly nearly allied, but the peculiar structure of the spikelet is quite constant in all the species I have examined.

Heads of spikelets solitary and globular, or very rarely with 2 short lateral ones.
  Second male flower usually present. Nut ovate, pale, nearly as long as the glumes. Larger glumes very unequal . . . . 1. *K. intermedia.*
  No second flower. Nut ovate, pale, much shorter than the glume. Larger glumes nearly equal, acutely keeled . . . . 2. *K. monocephala.*
Central head of spikelets oblong-cylindrical, with or without two or more shorter lateral ones. No second flower. Larger glumes scarcely keeled.
  Nut large, broad, usually very dark. Head of spikelets usually single . . . . 3. *K. cylindrica.*
  Nut narrow, pale. Heads of spikelets 3 to 5 . . . . 4. *K. triceps.*

1. **K. intermedia,** *R. Br. Prod.* 219.—Stems from a creeping rhizome slender, 6 in. to above 1 ft. high. Leaves grass-like, about 1 line broad, much shorter than the stem. Involucre of about 3 very unequal narrow bracts. Flower-head single, globular, about 3 lines diameter, the spikelets rather more acuminate and spreading than in *K. monocephala*, about 1½ lines long. The two larger glumes several-nerved without any very prominent keel, the innermost considerably larger than the other, and enclosing usually a second male flower in a small hyaline glume, the lowest empty glumes usually close under the larger ones and falling off with them. Nut ovate, pale-coloured, nearly as long as the glumes.

Queensland. Rockhampton, *O'Shanesy;* Moreton Bay or neighbourhood, *Leichhardt.*

N. S. Wales. Richmond, *R. Brown;* Blue Mountains and Liverpool Plains, *C. Moore;* Clarence River, *Beckler;* New England, *C. Stuart.*

Victoria. Mitta Mitta and Lower Hume Rivers, *F. Mueller.*

This species apparently the commonest in Australia is also in New Caledonia and probably in East India, often confounded with *K. monocephala.*

2. **K. monocephala,** *Rottb. Ic. et. Descr. Pl.* 13, *t.* 4, *f.* 4.—Stems tufted but often decumbent or stoloniferous at the base or from a long creeping rhizome, rarely above 1 ft. high and often only 6 in. Leaves shorter than the stem and very narrow in the typical form. Involucral bracts long and narrow. Flower-head or spike globular or ovoid, about 3 lines diameter or sometimes lengthening to 4 lines, solitary or

very rarely with a small one on each side. Spikelets 1-flowered, the larger glumes nearly equal or the inner one rather longer especially when in fruit, many-nerved with a prominent usually ciliate keel. Nut broadly ovate or obovate, pale-coloured, much shorter than the glume. —R. Br. Prod. 219; Kunth, Enum. ii. 129; Bœckel. in Linnæa, xxxv. 427; *K. pumila,* Mich.; Kunth, Enum. ii. 132, at least as to the Australian plant; *Cyperus monocephalus,* F. Muell. Fragm. viii. 271.

Queensland. Rockingham Bay, *Dallachy;* Rockhampton *O'Shanesy.*
N. S. Wales. Port Jackson (rare) *R. Brown, C. Moore;* Paramatta (only recently appeared there) and Richmond, *Woolls.*

Var. *latifolia.* Leaves and involucral bracts 1½ to 2 lines broad.—Moreton Bay, *Leichhardt;* Johnstone River, *Dallachy.* In one specimen from Rockhampton, *Thozet,* the stem is nearly 2 ft. long, the leaves very few with long sheaths and very short laminæ.

The species is common in tropical Asia and Africa, and probably identical with some of the American forms.

3. **K. cylindrica,** *Nees; Kunth, Enum.* ii. 133.—Rhizome tufted or shortly creeping. Stems from 6 in. to above 1 ft. high, the leaves much shorter. Involucral bracts rather long, spreading or reflexed. Flower-heads or spikes oblong-cylindrical, 5 to 6 lines long when fully out, solitary or with a small globular head on each side. Spikelets 1-flowered, the larger glumes broader than in the other species, rather above 1 line long, nearly equal, the keel not very prominent, with 3 or 4 nerves on each side, the articulation usually immediately below the larger glumes leaving the lower smaller one more persistent on the base of the stipes or rhachis or falling off separately. Nut broad, black, nearly as long as the glumes.—Bœckel. in Linnæa, xxxv. 415.

Queensland. Brisbane River, Moreton Bay, *F. Mueller, Bailey.*

The specimens scarcely differ from the East Indian ones in the rather larger glumes. African specimens from Clarence Peak and Cameroon Mountains may also belong to the same species though the glumes are larger and more acuminate.

4. **K. triceps,** *Rottb. Ic. et. Descr. Pl.* 14, *t.* 4, *f.* 6.—Stems tufted, not creeping, but the rhizome at length rather thick and shortly horizontal, from 6 in. to about 1 ft. high. Leaves much shorter and narrow. Involucral bracts long and narrow. Spikes or flower-heads usually 3, the central one ovoid-oblong, about 4 lines long, the lateral ones shorter and globular and occasionally a fourth or a fifth globular flower-head in the same cluster. Spikelets 1-flowered, scarcely 1 line long, narrow, the upper glumes nearly equal, 5- or 7-nerved, the keel not much more prominent than the lateral nerves. Nut narrow-oblong, pale coloured, shorter than the glumes.—Kunth, Enum. ii. 133; Bœckel. in Linnæa, xxxv. 413.

Queensland. Cape River, *Bowman;* Rockhampton, *O'Shanesy;* N. Queensland, *Nernst.*

The species is widely spread over tropical Asia and Africa, and should probably include some of the American forms.

2. CYPERUS, Linn.

(Mariscus, *Vahl.* Papyrus, *Willd.* Diclidium, *Schrad.*)

Spikelets with several often numerous flowers rarely reduced to 3, 2, or 1, all hermaphrodite or the terminal flower rarely male. Glumes distichous, concave or navicular and keeled, all nearly equal and flowering except the lowest 2 or 1 usually smaller and empty. No hypogynous scales or bristles. Stamens 3 or fewer. Style continuous with the ovary, not thickened at the base, deciduous, deeply or shortly divided into 2 or 3 filiform stigmatic branches or rarely almost or quite entire. Nut sessile, without any hypogynous disk, flattened biconvex or triquetrous, smooth or (frequently in the same species) minutely granular.—Perennials either tufted or forming horizontal or creeping rhizomes, rarely annuals. Stems simple under the inflorescence, Leaves few at the base of the stem or rarely covering it half way up with their sheaths, long or short or sometimes all reduced to the sheaths, of which the lower ones are scale-like covering the rhizome or leaving annular scars when they fall away. Spikelets in clusters heads or spikes, very rarely solitary at the ends of the rays or branches of a simple or compound irregular umbel, sometimes occupying the whole of the secondary rays, the central clusters or spikes always sessile in the centre of the umbel, the rays very unequal and sometimes the whole inflorescence contracted into a dense sessile compound cluster or head of spikelets, the general rhachis of the inflorescence rarely shortly produced, showing an interval between each ray. Under each ray is a persistent bract, one, two or more of the outer ones usually long and leaf-like forming an involucre round the inflorescence, the inner bracts and those which subtend the secondary rays and the spikelets usually small and scale-like, those under the spikelets rarely entirely wanting.

A very large and widely spread genus, second in the Order to *Carex* only in point of numbers, but much more prevalent than that genus in the tropical and subtropical regions both of the New and the Old World where it is everywhere abundant. It is represented also by a few species in more temperate regions, but quite disappears in the extreme north and south as well as on Alpine heights. Of the 64 Australian species only 30 are believed to be endemic or have not yet been identified out of the territory. Of the remaining 34, one is only known out of Australia in New Caledonia, 1 in Norfolk Island, 1 in New Zealand and South Africa, 1 in Africa, 9 are tropical Asiatic species which have not been ascertained to extend further, 10 are generally spread over the tropical regions of the Old World, 11 more tropical species common in the Old World are also in America, and, amongst those set down here as endemic in Australia or peculiar to the Old World, there are a few which are represented in America by closely allied if not absolutely identical species.

The genus differs from those groups of *Scirpus* which having no hypogynous bristles formed Brown's genus *Isolepis*, solely in the distichous arrangement of the glumes, and this character is not constant in *Cyperus pygmæus*, whilst in *Scirpus cyperoides* the glumes are often very nearly distichous. From *Schœnus* it is generally distinguished by the habit and inflorescence, the flowers more numerous in the spikelets, the flowering glumes more regularly distichous and the straighter rhachis of the spikelet, but none of these characters are absolutely constant. A few exceptional intermediates occur among the species of both genera.

Sect. I. **Pycreus.** *Spikelets flat with navicular keeled glumes. Style usually 2-cleft. Nut more or less flattened, with one edge next the rhachis.*

Nut ovate or obovate, not exceeding half the length of the glume.

Dwarf tufted annual. Spikelets in loose clusters in an umbel of 3 to 6 rays. Keel of the glumes produced into a straight or recurved point, the sides nerveless . . . . 1. *C. pumilus.*

Perennial mostly under 1 ft. Spikelets 1 to 1¼ lines broad, in a single loose cluster or rarely 1 or 2 short umbel-rays. Glumes broad, obtuse, the sides dark or with a dark patch . . . . 2. *C. eragrostis.*

Annual or perennial much under 1 ft. Spikelets 1 to 1½ lines broad, few in the clusters in an umbel of few rays or all in one cluster. Glumes broad, obtuse, very pale or yellowish green . . . . . 3. *C. flavescens.*

Perennial, mostly under 1 ft. Spikelets narrow, in heads or clusters all sessile or in an umbel of few rays. Glumes rather narrow, almost acute, the sides of a pale brown. . . . . 4. *C. globosus.*

Perennial, 1 to 2 ft. Spikelets 2 lines broad, the clusters in an umbel of few rays. Glumes broad, rather acute, shining green or yellowish . . . . 5. *C. unioloides.*

Nut oblong, not exceeding half the length of the glume. Spikelets narrow, very numerous, in a dense sessile compound cluster, rarely with 2 or 3 elongated umbel-rays . . . . 6. *C. polystachyus.*

Nut broad, almost as long as the glume. Tall perennial. Spikelets loosely spicate and distichous along the rays of a large compound umbel . . . . 7. *C. flavicomus.*

Sect. II. **Juncellus.** *Spikelets flattened but usually thick. Style 2-cleft or rarely 3-cleft. Nut ovate or broad, with a flat or concave face next the axis, the back convex or with a raised central angle.*

Spikelets very numerous and closely packed in a small compound head with an involucre of long leafy bracts.

Dwarf annual. Involucre of several bracts. Pericarp not thickened . . . . 8. *C. pygmæus.*

Perennial, often 1 ft. high. Involucre of 2 very long bracts. Pericarp thickened at the base into a white prominent 2- or 3-lobed mass . . . . 9. *C. cephalotes.*

Spikelets few, in a single cluster, apparently lateral, the involucral bract continuing the stem . . . . . . 10. *C. lævigatus.*

Spikelets in clusters in a dense umbel of several short rays. Style hairy . . . . 11. *C. platystylis.*

Spikelets small numerous, in dense spikes along the rays of a large compound umbel. Stems 3 to 4 ft. . . 12. *C. alopecuroides.*

Sect. III. **Eucyperus.** *Spikelets flat, the rhachis not winged or rarely with an exceedingly narrow border. Style 3-cleft. Nut equally triquetrous.*

Spikelets numerous, in a single small dense globular head, with an involucre of long slender bracts. . . . . 13. *C. pulchellus.*

Spikelets spreading, pale-coloured, in a single sessile cluster or solitary. Glumes obtuse or very shortly pointed. Nuts short. (**Graciles**).

Annual not exceeding 2 in. Spikelets 1 or 2 apparently lateral, one involucral bract continuing the stem . 14. *C. tenellus.*

- Slender perennials. Spikelets or clusters terminal.
  - Glumes with 3 or 4 prominent nerves on each side and scarcely any nerveless margins . . . . . 15. *C. gracilis.*
  - Glumes with 1 or 2 nerves on each side near the keel and broad nerveless margins. Leaves almost filiform.
    - Spikelets clustered. Nuts more than half the glume 16. *C. enervis.*
    - Spikelets solitary or 2 together. Nuts scarcely half the glume . . . . 17. *C. debilis.*
  - Glumes with 1 nerve on the middle of each side. Leaves linear, often 1 line broad . . . . . . 18. *C. lævis.*
- Spikelets numerous, clustered or capitate, the clusters or heads solitary or in an umbel of few rays. Glumes with a prominent straight or recurved point. Small annuals (**Squarrosi**).
  - Keel of the glumes ending in a short slightly recurved point, with a nerve on each side. Nuts narrow . 19. *C. castaneus.*
  - Keel of the glumes ending in a long recurved point, the sides nearly nerveless. Nuts rather broad . 20. *C. cuspidatus.*
  - Glumes 3- or 5-nerved, tapering into a long recurved point, without nerveless margins. Nuts broad . 21. *C. squarrosus.*
- Spikelets dark-coloured, clustered or capitate in an umbel of few rays or the clusters rarely solitary. Nuts broad, as long as the glume (**Nigricantes**).
  - Spikelets small and numerous in dense globular heads. Glumes orbicular not ½ line long . . . . . . 22. *C. difformis.*
  - Spikelets spreading, in clusters of 3 to 6. Glumes above 1 line long . . . . 23. *C. tetraphyllus.*
- Spikelets pale or brown, clustered capitate or solitary on the rays of an umbel. Nuts broad, not above ½ the glume (except *C. filipes*) (**Compressi**).
  - Involucral bracts few, unequal, 1 or 2 longer than the inflorescence or all short.
    - Umbel-rays few. Stems weak. Spikelets oblong. Glumes acutely keeled, with 1 nerve in the middle of each side . . . . 24. *C. trinervis.*
    - Umbel-rays numerous.
      - Stems erect, very angular or flat. Spikelets small, linear, acute . . . . 25. *C. Haspan.*
      - Stems erect, leafy at the base. Spikelets very flat, ovate or oblong. Glumes brown with white edges . . . . 26. *C. concinnus.*
  - Involucral bracts 6 or more long leafy and unequal. Umbel rays long numerous and slender.
    - Spikelets solitary on each ray . . . . 27. *C. filipes.*
    - Spikelets in clusters of 3 or 4 on each ray . . . . 28. *C. pedunculosus.*
  - Involucral bracts about 6, nearly equal, rigid, erect or spreading. Umbel many-rayed or reduced to a dense cluster. Stem leafless . . . . 29. *C. vaginatus.*
- Spikelets pale or dark brown, clustered on the rays of an umbel. Nut narrow, nearly or quite as long as the glume (**Fulvi**).
  - Spikelets small and few-flowered, in little globular clusters in a compound umbel . . . . 30. *C. holoschœnus.*
  - Spikelets very flat, long and narrow linear, clustered in a compound umbel. Glumes mostly obtuse . . 31. *C. dactylotes.*
  - Spikelets very flat, linear, clustered in a simple umbel or compound cluster. Glumes tipped with fine points . . . . 32. *C. Gilesii.*

Spikelets rather thick, oblong or lanceolate. Glumes obtuse or scarcely acute. Stems obtusely triquetrous.

Spikelets 8 to 12-flowered. Glumes imbricate though rather loose . . . . 33. *C. fulvus.*

Spikelets 10 to 30-flowered. Glumes spreading scarcely imbricate . . . . 34. *C. carinatus.*

Spikelets of *C. carinatus.* Stems stout, acutely 3-angled. Involucral bracts 1 or 2 very long and scabrous . . . . 35. *C. alterniflorus.*

Spikelets usually numerous, in loose spikes along the rays of a simple or compound umbel (**Ornati**).

Spikelets flat, usually pale, the rhachis of the spike minutely hairy . . . . 36. *C. pilosus.*

Spikelets flat, of a rich brown. Glumes bordered by a scarious hyaline membrane . . . . 37. *C. ornatus.*

Spikelets flat, pale brown or yellowish green, very irregularly spicate. Glumes very obtuse, loosely imbricate . . . . 38. *C. Iria.*

Spikelets flat, pale, densely spicate. Glumes loosely imbricate, the keel produced into a short point . . 39. *C. eleusinoides.*

Spikelets very narrow-linear, loosely spicate and spreading, the glumes very narrow and distant . 40. *C. distans.*

SECT. IV. **Papyrus.**—*Spikelets flat or terete, the rhachis bordered by scarious wings, either persistent or at length more or less detached as small scales. Glumes imbricate. Style 3-cleft. Nut equally triquetrous.*

Spikelets shortly spicate or clustered on the rays of a simple or compound umbel. Nut not exceeding half the length of the glume (**Corymbosi**).

Stems leafless or the sheaths bearing a very short lamina.

Glumes concave, not at all or scarcely keeled. Nut more or less dorsally flattened . . . . 41. *C. tegetiformis.*

Glumes keeled. Nut equally triquetrous.

Stems transversely septate . . . . 42. *C. articulatus.*

Stems continuous . . . . 43. *C. diphyllus.*

Stems leafy at the base.

Spikelets rather flat, usually acute, shortly and rather loosely spicate or clustered . . . . . . 44. *C. rotundus.*

Spikelets linear, very flat, densely clustered or shortly spicate . . . . 45. *C. stenostachyus.*

Spikelets slightly flattened, in very dense short spikes or clusters. Stems acutely 3-angled. Leaves rather broad with long points . . . . . 46. *C. congestus.*

Spikelets very narrow, scarcely flattened, in dense clusters. Stems obtusely triquetrous. Leaves very narrow . . . . 47. *C. subulatus.*

Spikelets clustered or shortly spicate on the rays of a simple or campound umbel. Nut usually nearly as long as the glume (**Lucidi**).

Spikelets small, 5 to 8-flowered, in little globular clusters. Stems obtusely triquetrous . . . . . . 48. *C. sporobolus.*

Spikelets linear, scarcely flattened, 10- to 20-flowered, in close clusters or heads.

Stems obtusely triquetrous. Spikelets usually few in the heads . . . . 49. *C. angustatus.*

Stems stout, acutely 3-angled. Spikelets numerous in the heads . . . . 50. *C. Novæ Hollandiæ.*
Spikelets flat, of a rich brown.
Spikelets in globular clusters or heads, usually 8- to 12-flowered . . . . , ... 51. *C. Gunnii.*
Spikelets distinctly spicate, mostly 5- to 8-flowered . 52. *C. lucidus.*
Spikelets in lengthened spikes along the rays of a compound or rarely simple umbel.
Spikelets flat. Glumes loosely imbricate. Nut more than half the length of the glume.
Spikelets pale-coloured, 10- to 16-flowered, the rhachis scarcely winged . . . . 39. *C. eleusinoides.*
Spikelets of a rich brown, 3 to 8-flowered, the rhachis distinctly winged . . . . 52. *C. lucidus.*
Spikelets flat. Glumes closely imbricate. Nut less than half the length of the glume (**Exaltati**).
Spikelets thick, 1½ to 2 lines broad, pale-coloured, 4- to 8-flowered . . . . 53. *C. pennatus.*
Spikelets very flat, under 1 line broad, usually rich brown, 10- to 20-flowered . . . . 54. *C. exaltatus.*
Spikelets narrow, linear-terete, 10- to 20-flowered. Nut less than half the length of the glume.
Spikelets densely crowded, ½ in. long or more. Glumes prominently 7- or 9-nerved . . . . 55. *C. hæmatodes.*
Spikelets loosely spicate, mostly under ½ in. Glumes obscurely 3-nerved . . . . 56. *C. auricomus.*

SECT. V. **Diclidium.**—*Spikelets narrow, terete or nearly so, often flexuose, sometimes 1-flowered, the rhachis bordered by hyaline wings embracing the nuts. Flowering glumes distant, narrow, closely appressed to the rhachis. Style 3-cleft. Nuts triquetrous.*

Spikelets rather rigid, with 6 or more flowers, in elongated spikes in a large compound umbel . . . . 57. *C. ferax.*
Spikelets almost subulate, with 6 or more flowers, in short close spikes in an umbel of few rays . . . . . . 58. *C. Bowmanii.*
Spikelets filiform, 3- or 4-flowered, in loose spikes in a large compound umbel . . . . 59. *C. trichostachys.*
Spikelets mostly 2- or 3-flowered, in ovoid globular spikes in a simple umbel of few rays. Stems smooth . . 60. *C. leiocaulus.*
Spikelets 1- or 2-flowered, in ovoid or cylindrical spikes in a compound umbel of many rays. Stems scabrous 61. *C. scaber.*

SECT. VI. **Mariscus.**—*Spikelets small, numerous, terete or scarcely flattened, 1- or 2-flowered, the short enclosed rhachis bordered by hyaline wings. Flowering glumes imbricate when more than one. Style 3-cleft. Nut triquetrous.*

Spikelet usually with 2 perfect flowers, in small globular clusters in a compound umbel of many rays . . . 62. *C. decompositus.*
Spikelets with 1 or rarely 2 perfect flowers, in loose cylindrical spikes in a compound umbel . . . . . . 63. *C. Armstrongii.*
Spikelets usually with 1 perfect flower, in dense cylindrical spikes either sessile or pedunculate in a simple umbel . . . . 64. *C. umbellatus.*
Spikelets usually with 1 perfect flower, in dense ovoid or 3-lobed heads in a simple umbel . . . . 65. *C. conicus.*

The following species have been supposed to be Australian by Kunth and Boeckeler, on the authority of specimens of Sieber's Agrostotheca, which however all prove to be West Indian.

Mariscus parviflorus, Nees in Sieb. Agrostoth., n. 101=*Cyperus lusulæ*, Rottb.

Cyperus microcephalus, Nees in Sieb. n. 103 (*C. Sieberinus*, Spreng. Syst. Cur. Post. 29).=*C. surinamensis*, Rottb.

Carex Sieberi, Nees in Sieb. n. 104 (*Mariscus rigidus*, Spreng. Syst. Cur. Post. 29) = *Cyperus flavus*, Bœckel. (*Mariscus flavus*, Vahl).

Cyperus ligularis, Linn.; Sieb. Agrostoth. n. 106.

C. spectabilis, Schreb.; Kunth, Enum. ii. 73, was published as an Australian plant on the authority of one received at the garden of Erlangen from the Jardin des Plantes at Paris under the name of *C. Paramatta*, Mart. No such name occurs in the Catalogues of the Jardin, and Bœckeler in Linnæa, xxxv. 605, identifies the plant with a Mexican species.

SECTION 1. PYCREUS, Nees.—Spikelets several-flowered, flat with navicular keeled glumes, the rhachis not winged or with a narrow border. Style usually 2-cleft. Nut more or less flattened, with one edge next the rhachis.

The section is a somewhat artificial one, the first five species having the habit of some of the *Compressi*, the *C. polystachyus* often resembling the *C. rotundatus*, and the *C. flavicomus* has the habit of *C. procerus*.

1. **C. pumilus**, *Linn.; Kunth, Enum.* ii. 4.—A dwarf tufted annual, the stem seldom above 3 or 4 in. high, the leaves mostly shorter and narrow. Umbel simple or slightly compound, of 3 to 6 slender rays, the longest 1 to 2 in. long, besides the sessile clusters. Spikelets 6 to 12 together, in loose clusters or short spikes. Involucral bracts generally 3, of which 1 or 2 longer than the inflorescence. Spikelets resembling those of *C. cuspidatus*, linear-lanceolate, very flat, rather acute, brown, 3 to 4 lines long and under 1 line broad, 16- to 20-flowered, the rhachis not winged. Glumes spreading, loosely imbricate or rather distant, the green keel with a prominent nerve on each side, produced into a short spreading or longer and recurved point, the brown scarious nerveless sides ending obtusely below the point. Stamens 2 or sometimes 1 only. Style 2-cleft. Nut obovate, biconvex, with one edge next the rhachis, less than half the length of the glume. —*C. nitens*, Vahl; Bœckel. in Linnæa, xxxv. 483; *C. breviculimis*, F. Muell. Fragm. viii. 267, not of R. Br.

Queensland. Port Denison, *Fitzalan;* Rockhampton, *O'Shanesy.*

The species is widely spread over tropical Asia and Africa. Bœckeler is evidently right in uniting as one species the first five of Kunth's *Cyperi*, described under the names of *C. hyalinus*, *C. nitens* and *C. membranaceus*, Vahl, *C. punctatus*, Roxb. and *C. pumilus*, Linn. The Australian specimens belong to the var. *patens*, Bœckel. (*C. patens*, Vahl, not seen by Kunth), with looser spikes and rather narrower spikelets than in the commoner East Indian forms.

2. **C. eragrostis**, *Vahl; Kunth, Enum.* ii. 7.—A perennial, flowering perhaps sometimes the first year, but forming short slender creeping or ascending rhizomes, and sometimes with the short tufted aspect of *C. flavescens*, differing from that species chiefly in the colour of the glumes. Stems mostly 6 in. to about 1 ft. high. but sometimes shorter or longer. Leaves shorter than the stem, all radical or extending nearly half way up. Spikelets either very few in a sessile cluster, or more numerous in a compound cluster or with 1 or 2 slightly elongated umbel rays each bearing a cluster. Involucre of 2 to 4 narrow bracts, 1 or 2 much longer than the inflorescence. Spikelets flat, dark brown

or almost black, oblong or broadly linear, 3 to 6 lines long and about 1 line broad with about 12 to 24 flowers, the rhachis not winged. Glumes loosely imbricate, rather spreading, broad, obtuse, with a more or less marked greenish keel, the sides nerveless, either a rich brown with narrow hyaline margins, or hyaline with a dark brown patch. Stamens usually 2. Style 2-cleft. Nut obovate, but varying much in breadth, biconvex or nearly flat, one edge next to the rhachis, less than half the length of the glume.—Bœckel. in Linnæa, xxxv. 443; F. Muell. Fragm. viii. 260; *C. areolatus*, R. Br. Prod. 216.

Queensland. Brisbane River, *Bailey;* Boyne River, *Hartmann.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Woolls, Mrs Calvert;* New England, *C. Stuart;* Richmond River, *C. Moore, Mrs. Hodgkinson.*

Victoria. Mount Aberdeen and Buffalo Range, *F. Mueller;* and a dwarf form 1 to 2 in. high, Mitta-Mitta and Upper Humo Rivers, *F. Mueller.*

S. Australia. Torrens River, *F. Mueller.*

The species is widely distributed over East India, extending on the one hand to west tropical Africa, and on the other, more sparingly, to the Malayan Archipelago. Among the Indian forms Bœckeler distinguishes the larger ones with the elongated leafy stems rooting at the base under the name of *C. atratus*, Bœckel. in Linnæa, xxxv. 446, but the two forms are too much connected in Australia as in India by intermediates to be specifically separated. The South African *C. Mundtii*, Kunth, has been sometimes, but erroneously referred to this species. *C. nitidus*, Lam. Illustr. i. 145, founded on an East Indian plant described and figured by Rottboell, Ic. et Descr. Pl. 29, t. 9, f. 4, is however evidently the larger form of *C. eragrostis*, and not the African *C. lanceus*, to which Bœckeler, Linnæa, xxxv. 462, refers it on the authority of a specimen in Vahl's herbarium said to come from Lamarck, but which cannot be considered as authentic. In this uncertainty it could only produce confusion to adopt Lamarck's older name for either species.

3. **C. flavescens,** *Linn.; Kunth, Enum.* ii. 5.—In the typical Mediterranean form usually a small tufted annual, but even there said by some to be perennial and, in the Australian specimens referred to it with some doubt, perhaps perennial and above 6 in. high. Leaves narrow, much shorter. Spikelets few together or rarely more numerous, in clusters in a simple umbel of 3 or 4 rays, or the whole reduced to a sessile cluster. Involucral bracts 2 or 3, of which 1 or 2 much longer than the inflorescence and narrow. Spikelets oblong or broadly linear, obtuse, flat, 3 to 4 lines long when fully out and 1 line or rather more broad, of a shining yellowish green when fresh, pale in the dried specimens, 12- to 20-flowered, the rhachis not winged. Glumes very obtuse and rather broad, with 3 or 5 nerves closely adjoining in a broad dorsal keel, the sides nerveless. Stamens said to be 3, but certainly 2 only in the upper or nearly all the flowers of several specimens. Style 2-cleft. Nut flat, ovate, with one edge next the rhachis, about half the length of the glume.—Sibth. Fl. Gr. t. 47; Host. Gram. iii. t. 72; Reichb. Ic. Fl. Germ. t. 278; Bœckel. in Linnæa, xxxv. 438.

N. S. Wales, *Woolls;* Bowen Downs, *Birch.*

The typical form belongs to the Mediterranean region and chiefly to its western portion, but there are tropical African, Mascarene and a few East Indian specimens which, like the Australian ones above mentioned, appear to be referable to the true

C. flavescens rather than to the *C. globosus*. It is possible however that the Australian ones may prove to be an anomalous form of *C. eragrostis* without the dark colour, on the glumes, and Sieber's specimens, Agrostotheca, n. 105, are not Australian. The Brazilian *C. Olfersianus*, Kunth, is scarcely to be distinguished from the typical *C. flavescens*, and some of the North American annual digynous species are very near to it.

4. **C. globosus,** All.; *Bœckel. in Linnæa*, xxxv. 458.—A tufted perennial, the stems from under 6 in. to above 1 ft. high. Leaves shorter, very narrow, sometimes almost setaceous, the lower sheaths often broad. Spikelets 3 or 4 together or frequently more numerous, in clusters in an umbel of 3 to 6 rays, either all short or the outer ones 1 to 2 inches long, or the whole reduced to a single sessile cluster. Involucral bracts 2 or 3, of which 1 or 2 longer than the inflorescence. Spikelets linear or linear-lanceolate, flat, rather acute, pale or dark brown, from 4 to 6 lines long and scarcely 1 line broad, 12- to 40-flowered, the rhachis not winged. Glumes rather narrow, obtuse or almost acute, the keel pale-coloured, faintly 3-nerved, the sides brown, nerveless, sometimes with a light-coloured margin. Stamens usually 2. Style 2-cleft. Nut obovate or almost orbicular, biconvex, one edge next the rhachis, much less than half the length of the glume.—Reichb. Ic. Fl. Germ. f. 279; *C. vulgaris*, Sieb. in Kunth, Enum. ii. 4; F. Muell. Fragm. viii. 260; *C. flavescens*, Thw. Enum. Ceyl. Pl. 342, and other Indian authors.

Queensland. Lockyer and Brisbane Rivers, *Hartmann*.
Victoria. Upper Hume River, *F. Mueller*.

The species is widely distributed over tropical and temperate Asia, extending to the Mediterranean region, and is also in east tropical Africa and the Mascarene Islands. It has been united by Thwaites with the *C. flavescens*, and certainly a few Indian specimens appear to connect the two, but generally speaking it seems very distinct in its taller more perennial stature, narrower more acute darker-coloured spikelets, and especially in the narrow glumes with brown sides. The Victorian specimens with dark-coloured spikelets come very near to the Indian *C. Junghuhnii* Miq., reduced by Bœckel. in Linnæa, xxxv. 458, to *C. nilagiricus*, Hochst., but the latter appears to be a variety only of *C. globosus*.

5. **C. unioloides,** *R. Br. Prod.* 216.—A perennial, tufted or with a short creeping rhizome. Stems 1 to 2 ft. high, triquetrous. Leaves flat but narrow, rather rigid, mostly shorter than the stem, with long brown sheathing bases. Umbel compound, of 3 to 6 rays, the longest 1 to 3 in. long, the spikelets 4 to 12 together in clusters or short loose spikes. Involucral bracts 2 to 4, 1 usually much longer than the inflorescence. Spikelets oblong-lanceolate or almost ovate, flat but rather thick, 4 to 8 lines long and about 2 lines broad, of a shining yellowish green or pale brown, 12- to 20-flowered, the rhachis not winged. Glumes broad, rather acute, with a prominent greenish keel, the sides smooth and nerveless. Stamens usually 3. Style 2-cleft. Nut broadly obovoid or orbicular, biconvex with one edge next the rhachis, much less than half the length of the glume.—*C. bromoides*, Willd. MS.; Kunth, Enum. ii. 8; *C. angulatus*, Nees; Bœckel. in Linnæa, xxxv. 465; *C. lanceus*, F. Muell. Fragm. viii. 259, not of

Thunb.; *C. luteolus,* Bœckel. in Flora, 1875, 82 (from the character given).

Queensland, Shoalwater Bay, *R. Brown;* Brisbane River, *F. Mueller.*
Victoria. Upper Hume River at an elevation of 3000 to 4000 ft., *F. Mueller.*

The species extends over Nepaul and the eastern provinces of India, it is also in Brazil and in South Africa, where however the true *C. lanceus,* Thunb., with more acute deep brown spikelets, is much more abundant.

6. **C. polystachyus,** *Rottb. Descr. et Ic. Pl.* 39, t. 11. f. 1.—A tufted perennial. Stems from under 1 ft. to above 2 ft. high, triquetrous but not very stout. Leaves narrow, much shorter than the stem, with short broad sheaths. Inflorescence usually crowded into a dense sessile head or cluster with numerous spikelets, but sometimes forming a loose irregular umbel approaching that of some varieties of *C. rotundus.* Involucral bracts 2 to 4, of which 1 or 2 longer than the inflorescence. Spikelets narrow-linear, flat, rather acute, 4 to 6 lines long and under 1 line broad, usually pale-brown, 20- to 30-flowered, the rhachis angular and often slightly winged. Glumes closely distichous, rather narrow, obtuse or with the keel produced into a short point, the sides indistinctly nerved. Stamens usually 2. Style 2-cleft or very rarely here and there 3-cleft. Nut narrow, biconvex, not half so long as the glume.—R. Br. Prod. 214; Kunth, Enum. ii. 13; Bœckel. in Linnæa, xxxv. 477; F. Muell. Fragm. viii. 265.

Queensland. Northumberland Islands, *R. Brown;* Sir C. Hardy Island, *Henne;* Cape York, *Daemel;* Rockingham Bay, *Dallachy;* Port Curtis, *M'Gillivray;* Brisbane River, Moreton Bay, *F. Mueller;* Rockhampton and various localities in S. Queensland, *Bowman,* and many others.
N. S. Wales. Port Jackson, *R. Brown, Woolls,* and others; New England, *C. Stuart;* Clarence River, *Beckler;* Richmond River, *C. Moore.*

Var.? *laxiflora.* Spikelets loosely clustered, often stipitate and almost racemose or corymbose in an umbel of 6 to 10 slender rays, the longest often 2 to 3 in. long. Nut rather broader.—*C. aquatilis,* F. Muell. Fragm. viii. 270, not of R. Br.

N. Australia. Arnhem's Land, *F. Mueller.*
Queensland. Daintree River, *Fitzalan;* Rockingham Bay, *Dallachy.*

This variety has much resemblance with some of the looser flowered forms of *C. rotundus,* with small pale spikelets, but is readily distinguished by the style and nut. It may be a distinct species but is connected with the typical form by several Indian specimens. The species is common in the warmer regions of both the New and the Old World, extending northward to the Mediterranean and S. China in the Old World and to the Southern United States in America.

7. **C. flavicomus,** *Mich.; Kunth, Enum.* ii. 15.—A tall elegant perennial. Stems prominently 3-angled, 2 to 3 ft. high. Leaves much shorter, rather narrow. Umbel large and loose, often compound, the longer rays often 4 to 6 inches long, with numerous spikelets distichously spicate along the partial rays. Involucral bracts 3 or more, of which 1 or 2 much longer than the infloresence, and the lowest sometimes 4 or 5 lines broad. Spikelets spreading, lanceolate, flat, ½ to 1

in. long, and at length 2 lines broad, 12- to 20-flowered, the angles of the rhachis bordered by a narrow hyaline wing. Glumes spreading and quite distinct, giving the spikelet a pinnate appearance, broad, obtuse, the keel green, the sides smooth or pale and always bordered by a white hyaline margin. Stamens 3. Style 2-cleft. Nut broad, flat with one edge next the rhachis, nearly as long as the glume.—Bœckel. in Linnæa, xxxv. 470; *C. tremulus*, Poir.; Kunth, Enum. ii. 16; *C. Hochstetteri*, Nees; Bœckel. l. c. 471; *C. patuliflorus*, Bœckel. l. c. 473; *C. ornatissimus*, F. Muell. Fragm. viii. 265, ix. 54.

N. Australia. Head of Sturt's Creek, *F. Mueller;* Arnhem's Land, *M'Kinlay.*

The species is also in the Indian Peninsula, in tropical Africa and the Mascarene Islands, and in Mexico and the southern United States of North America and is nearly allied to the more common Indian *C. puncticulatus*, in which the glumes are more closely imbricate and have not the white border. The N. American specimens have usually smaller spikelets and glumes than the Indian and Australian, but some Mexican ones and others from tropical Africa (correctly referred to *C. flavicomus* by J. Gay), are quite as large as in some of the Australian specimens.

SECTION II. JUNCELLUS, Griseb.—Spikelets flattened but usually thick, with concave glumes, the rhachis not winged. Style 2-cleft or occasionally 3-cleft. Nut ovate or broad, with a flat or concave face next the rhachis, the back convex or with a raised central angle.

This section is fairly marked in character, but not very natural, the globose capitate inflorescence of the first two species is repeated in *C. pulchellus* and in *C. dubius* and some other Indian ones, the lateral inflorescence of *C. lævigatus* is exceptional in the genus, *C. alopecuroides* has the habit nearly of *C. exaltatus.*

8. **C. pygmæus,** *Rottb. Descr. et Ic. Pl.* 20, *t.* 14, *f.* 4, 5.—A densely tufted low annual, the stem usually under 6 in. high. Leaves mostly shorter and very narrow. Spikelets small and exceedingly numerous, densely crowded into a globular compound head not exceeding ½ in. diameter. Involucral bracts 2 or 3, embracing the head by a broad base, with leafy points of 1 to 3 in., and often a few of the inner bracts leafy and protruding more or less from the head. Spikelets flat, ovate or oblong, about 2 lines or in luxuriant specimens nearly 3 lines long and 1 to 1½ lines broad, 12- to 20- or even more-flowered without any empty glumes at the base, but subtended by a glume-like bract, the rhachis not winged. Glumes pale green, shortly acuminate, prominently keeled, the sides more or less hyaline. Stamens usually 1 only. Style 2-cleft or rarely 3-cleft. Nut ovate, shorter than the glume, the broad flat inner face next the rhachis, the back convex or, when the style is 3-cleft, with a dorsal raised angle. —Kunth, Enum. ii. 18; Bœckel. in Linnæa, xxxv. 493; F. Muell. Fragm. viii. 268.

N. Australia. Upper Victoria River and Flinders River, *F. Mueller;* Charlotte Waters in Central Australia, *Giles;* also in Mitchell district.
Queensland. *Mitchell.*
Victoria. Ovens River, *F. Mueller.*

The species is abundant in tropical and subtropical Asia and in the Mediterranean region, extending here and there into more temperate regions both in Europe and Asia, and reappearing in Mexico and Cuba. In Australia it retains the typical form with flat spikelets regularly distichous or the arrangement only here and there slightly disturbed. In the form the most frequent in the Mediterranean region, the spikelet assumes an irregular twist or the glumes are more or less arranged in 3 to 5 ranks, on which account it was referred by Linnæus to *Scirpus* under the name of *S. Michelianus* (*Isolepis Micheliana*, Kunth, Enum. ii. 203); but Bœckeler is probably right in regarding it as a variety only of *C. pygmæus*. Several Indian specimens appear to be quite intermediate. F. Muell. Fragm. ix. 7, includes under *Isolepis Micheliana* this species and the *Scirpus humillimus*, Benth.

9. **C. cephalotes**, *Vahl; Kunth, Enum.* ii. 48.—Stems from about 6 in. to above 1 ft. high. Spikelets small and numerous, densely crowded into a sessile globular or conical compound head about ½ in. diameter. Involucral bracts with a lanceolate base, 2 or 3 very long often above 1 ft. Spikelets imbricate or at length spreading, pale coloured or varied with brown, flat, 2 to 3 lines long and 1 to 1¼ lines broad, 10- to 20-flowered, the short rhachis not winged. Glumes rather spreading, concave or navicular, obscurely several-nerved, the acutely prominent keel sometimes minutely ciliate. Stamens usually 2. Style undivided or unequally 2-cleft, rarely 3-cleft. Nut ovate, flattened, rather shorter than the glume, the broad inner face next the rhachis, the back convex, the lower part of the pericarp thickened into a white cellular mass projecting in 2 or 3 lobes up the angles of the upper thin seed-bearing part, and falsely described as an adnate perigynium. — *Anosporum monocephalum*, Nees; Bœckel. in Linnæa, xxxvi. 411; F. Muell. Fragm. viii. 272; *Cyperus Hookerianus*, Thw. Enum. Ceyl. Pl. 342.

Rockingham Bay, *Dallachy*. Rather widely spread over E. India.

The thickening of the base of the pericarp is a curious anomaly, occurring in a few species belonging to different groups of *Cyperus* and in one species of *Scirpus*, and being unaccompanied by any other character, cannot be of importance enough to retain the very artificial genus as proposed by Bœckeler.

10. **C. lævigatus,** *Linn.; Bœckel. in Linnæa*, xxxv. 486.—Rhizome usually creeping. Stems 6 in. to 1½ ft. high, enclosed at the base in 2 or 3 brown sheaths, one of which is often produced into a short erect rigid leaf. Spikelets 6 to 12 together or sometimes only 2 or 3, in a sessile cluster apparently lateral, the longest of the 2 involucral bracts being erect and continuous with the stem. Spikelets in the normal and only Australian form of a pale green or almost white, lanceolate, or broadly linear, flat but rather thick, with a longitudinal groove on each face, 4 to 5 rarely 6 lines long, about 2 lines broad, with often above 30 flowers, the rhachis not winged. Glumes very closely imbricate, obtuse, broad and concave, the keel scarcely prominent and the nerves very faint. Style 2-cleft. Nuts broadly obovate or orbicular, flattened, the broad inner face next the rhachis, mostly about half the length of the glume.—Rottb. Descr. et. Ic. Pl. t. 16, f. 1; F. Muell. Fragm. viii. 266; *C. mucronatus*, Rottb. l. c. 19, t. 8, f. 4; Kunth, Enum. ii. 17; *Pycreus lævigatus*, Nees in Pl. Preiss. ii. 72.

W. Australia. Swan River, *Drummond*, *n.* 325, *Preiss*, *n.* 1808. Widely spread over the warmer regions both of the New and the Old World, chiefly in maritime districts. The Australian specimens have all the typical pale-coloured spikelets. In the Mediterranean region the *C. junciformis*, Cav., now generally recognised as a variety of *lævigatus*, with dark brown glumes more prominently keeled, is more common than the typical form, but is not in Australia.

11. **C. platystylis,** *R. Br. Prod.* 241—Stems tufted, rather stout, not above 1 ft. high. Leaves rather broad, shorter and mostly much shorter than the stem, with flattened acutely keeled sheaths. Umbel very compact, of about 6 rays, the longest under 1 in. Spikelets 6 to 12 in the clusters. Involucral bracts 1 or 2 longer than the inflorescence and one or two short. Spikelets brown, flat but rather thick, 4 to 6 lines long, 1½ lines broad, acute, the rhachis not winged. Glumes very regularly distichous and imbricate, broadly concave, the lower ones obtuse, the upper ones acute, the keel slightly prominent sometimes produced into a short point, the nerves very faint. Style 2- or 3-cleft, flattened or triquetrous in the upper part, the angles ciliate. Nut oblong or oval-oblong, as long as the glume, the flat face next the rhachis, the back convex.

N. S. Wales. Hawkesbury, *R. Brown.* The style is quite that of *Fimbristylis*, all the other characters those of *Cyperus*.

12. **C. alopecuroides,** *Rottb. Descr. et Ic. Pl.* 38, *t.* 8, *f.* 2.—Stems tufted at the base, stout and triquetrous, attaining 3 or 4 ft. Leaves shorter, rather numerous. Umbel large, compound but very irregular, the rays rigid, erect, the longer ones sometimes at least 6 in. long, sometimes all short and compact, the spikelets very numerous, and densely crowded all round the rhachis, in cylindrical spikes of 1 to 1¼ in., occupying the whole or the greater part of the secondary rays. Involucral bracts several, the outer ones from a broad base sometimes 1 to 2 ft. long, rarely all shorter than the inflorescence. Spikelets lanceolate, not very flat, mostly about 2 lines long and under 1 line broad, pale-coloured, 8- to 12-flowered, or rarely longer with more flowers, the rhachis angular but not winged. Glumes broad, concave, with several not very prominent nerves, the keel prominent in the upper part only, and often produced into a short spreading point. Stamens 2 or rarely 3. Style 2-cleft, one branch often very short, rarely 3-cleft. Nut obovate, scarcely half the length of the glume, much flattened, the broad inner face next the rhachis, the back convex or with a raised central angle.—R. Br. Prod. 217; Kunth, Enum. ii. 19; Bœckel. in Linnæa, xxxvi. 321; F. Muell. Fragm. viii. 263.

Queensland. Shoalwater Bay, *R. Brown*; Gracemere, *O'Shanesy*.

An unnamed specimen in herb. R. Brown, in the next sheet to his *C. alopecuroides* and probably representing the *C. compositus*, R. Br. Prod. 217, appears to be the *C. alopecuroides* with the inflorescence not yet fully developed. The species extends over tropical Asia and Africa.

SECTION III. EUCYPERUS.—Spikelets flat, with navicular or rarely concave glumes usually keeled, the rhachis not winged or the angles rarely bordered by an exceedingly narrow hyaline margin. Style 3-cleft. Nut equally 3-sided, or rarely (in *L. tetraphyllus*) dorsally compressed.

13. **C. pulchellus,** *R. Br. Prod.* 213.—A small slender plant with the habit of *Kyllinga monocephala*, but probably annual. Stems rarely above 6 in. high. Leaves much shorter, few and narrow or almost setaceous. Spikelets numerous, in a dense globular sessile head 3 to 4 lines diameter. Involucral bracts usually 3, spreading or reflexed, two of them much longer than the head. Spikelets very flat, pale coloured, ovate, rarely above 1 line long and nearly as broad, 8- to 12-flowered, the rhachis not winged. Glumes rather narrow, concave, spreading, obtuse, almost hyaline, the keel slightly prominent and one faint nerve on each side. Stamens usually 1 only. Styles 3-cleft. Nut oblong, obtuse, obtusely triquetrous, not quite half as long as the glume.—F. Muell. Fragm. viii. 271; *Sorostachys kyllingioides*, Steud. Syn. Glum. ii. 71; *Cyperus sorostachys*, Bœckel. in Linnæa, xxxv. 588.

N. Australia. Arnhem Bay, *R. Brown*; Gulf of Carpentaria, *F. Mueller.*
Queensland. Beef Creek, *Leichhardt*; Gainsford, *Bowman.*

The species is also in East India and the Malayan Archipelago. It is very closely allied to *C. leucocephalus*, Retz.

14. **C. tenellus,** *Linn. f.; Kunth, Enum.* ii. 25.—A densely tufted annual, with filiform stems not exceeding 2 in. and sometimes not above ½ in. high. Leaves short and filiform. Spikelets solitary or 2 or 3 together, apparently lateral, one involucral bract erect and continuous with the stem, a second one usually very short. Spikelets very flat, pale coloured, oblong, 2 to 3 lines long, rather above 1 line broad, 10- to 20-flowered, the rhachis not winged. Glumes rather broad, spreading, obtuse or very shortly and obtusely acuminate, prominently keeled, with 2 to 4 nerves on each side, and rather broad whitish nerveless margins. Stamens 1 or 2. Style 3-cleft. Nut elliptical, prominently 3-angled, more than half the length of the glume.—F. Muell. Fragm. viii. 261; *C. minimus*, Thunb.; Bœckel. in Linnæa, xxxv. 523, not of Linn.

N. S. Wales. Paramatta, *Woolls.*
W. Australia. *Drummond, n.* 222 *and* 366.

The species is also in New Zealand and in South Africa, it is well figured in Pluken. Almag. t. 300, f. 4 and represented in the Linnean herbarium by an authentic Cape specimen. *C. modestulus* Steud. Syn. Glum. ii. 16 from King George's Sound, *D'Urville*, which I have not seen, is from the character given probably the same species.

15. **C. gracilis,** *R. Br. Prod.* 213.—Stems tufted, very slender, from under 6 in. to nearly 1 ft. high. Leaves filiform, shorter than the stem, with short brown sheaths. Spikelets usually 2 to 4 or rarely more together in a sessile terminal cluster or head. Involucral bracts usuall-

3, filiform slightly dilated at the base, the longest attaining several inches. Spikelets flat, oblong-lanceolate, 2 to 3 lines long, rather above 1 line broad, of a pale brown or green, with 8 to 12 or rarely more flowers, the rhachis not winged. Glumes rather broad, somewhat acute and rather spreading at the point, with 3 or 4 prominent nerves on each side and scarcely any nerveless margins. Stamens usually 3. Style 3-cleft. Nut broad, prominently 3-angled, not much shorter than the glume.—F. Muell. Fragm. viii. 264.

Queensland. Rockingham Bay, *Dallachy*; Rockhampton, *O'Shanesy*; Dawson River, *F. Mueller.*
N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, *Agrostoth. n.* 23, *Woolls* and others; Clarence River, *Wilcox.*

Var? *rigidella.* Leaves not so slender and rather more rigid.—Head of Boyd River, *Leichhardt*; Lake Eyre, *Andrews.*

F. Mueller is disposed to unite the three following species with *C. gracilis*, which is also in New Caledonia. It is nearly allied to the common tropical *C. compressus*, but to no other American species in our collections. The *C. simplex*, H. B. and K. (*C. umbrosus*, Lindl.) is much nearer to *C. filipes* and *C. peduncularis.*

16. **C. enervis**, *R. Br. Prod.* 213.—Stems tufted, slender, from under 6 in. to nearly 1 ft. high, with filiform leaves as in *C. gracilis.* Inflorescence the same except that the spikelets are rather more numerous and rather longer with 12 to 16 flowers. Glumes broad, loosely imbricate but not spreading, obtuse or the keel produced into a very short straight point, with 1 or rarely 2 prominent nerves on each side of the keel, the broad sides otherwise nerveless. Nut as in *C. gracilis* not much shorter than the glume.

Queensland. Rockingham Bay, *Dallachy*; East Coast, *R. Brown*; Brisbane River, *herb. F. Mueller.*
N. S. Wales. Blue Mountains, *Woolls*; Clarence River, *Beckler*, *Wilcox*; New England, *C. Stuart*; Macleay River, *C. Moore*; Richmond River, *Mrs. Hodgkinson*; near Bulli, *Johnson.*

Var. *laxus*, the lateral spikelets sometimes pedunculate.—New England, *C. Stuart.*

17? **C. debilis**, *R. Br. Prod.* 213.—A slender tufted plant with setaceous leaves and involucral bracts, closely allied to *C. gracilis* and *C. enervis*, and possibly a variety of the latter. Spikelets solitary or rarely 2 together, very much like those of *C. enervis.* Glumes rather broad, with 1 or very rarely 2 nerves on each side of the keel and a rather broad nerveless margin. Nut broad, much shorter than the glume, acutely or at length obtusely 3-angled, more or less distinctly marked with fine longitudinal striæ.

N. S. Wales. Hawkesbury, *R. Brown*; Clarence River, *Beckler*; also in *Leichhardt's* and in *Woolls's* collections.

In Brown's specimens the spikelets are constantly solitary, the nuts not half the length of the glumes and striate only under a strong lens; in Beckler's the spikelets are often two together, the nuts at least half the length of the glumes and more prominently striate; Leichhardt's and Woolls's are similar but the glumes rather more striate.

18? **C. lævis,** *R. Br. Prod.* 213.—Not so slender as *C. enervis.* Stems 1 ft. high or rather more, acutely triquetrous. Leaves often above 1 line broad, with thickened nerve-like edges or inflexed margins. Spikelets 6 to 8 or more in a dense sessile cluster, spreading, pale coloured, flat, 3 to 4 lines long and about 1 line broad when fully out, 10- to 20-flowered, the rhachis not winged. Glumes spreading, rather broad, the keel prominent and sometimes produced into a very short point, the sides nerveless and sometimes with a dark spot or with a not very prominent nerve in the centre as in *C. trinervis.* Stamens 2 or 3. Style 3-cleft. Nut ovoid-triangular, about half the length of the glume.

N. S. Wales. Port Jackson, *R. Brown ;* Maroochie River, *Bailey.*

I have seen but very few specimens of this species which may possibly prove to be a variety of *C. trinervis* with the inflorescence of *C. enervis,* but the habit is somewhat different from both.

19. **C. castaneus,** *Willd. ; Kunth, Enum.* ii. 21.—A small tufted annual, the stems rarely above 4 in. high and sometimes under 1 in. Leaves setaceous, shorter or rarely longer than the stem. Spikelets numerous, in dense clusters either solitary and sessile, or 2 or 3 lateral ones on peduncles or umbel-rays of ½ to ¾ in. Involucral bracts 2 to 4, setaceous, mostly longer than the inflorescence. Spikelets linear, flat, of a rich brown, 4 to 6 lines long and scarcely above ½ line broad, about 12- to 20-flowered, the rhachis not winged. Glumes rather narrow, the very prominent keel produced into a recurved point, shorter however than in the two following species, with a more or less distinct nerve on each side, the sides or marginal appendages nerveless, brown, terminating often abruptly below the recurved point. Stamen usually 1. Style 3-cleft. Nut narrow-oblong, obtusely 3-angled, more than half the length of the glume.—Bœckel. in Linnæa, xxxv. 496; *C. squarrosus* var. *stenocarpus,* F. Muell. Fragm. viii. 262.

Queensland. Dry Beef Creek, *Leichhardt.*

The species is in the East Indian Peninsula, in Ceylon and in Sikkim, and scarcely distinct from the *C. aureus,* H. B. and K., which is widely spread over the tropical regions of the New and the Old World.

20. **C. cuspidatus,** *H. B. et K.; Kunth, Enum.* ii. 22.—A small tufted annual, resembling *C. castaneus* and *C. squarrosus* in habit, but the clusters of spikelets not so dense, and the glumes different. Stems mostly 2 to 4 in. long. Leaves very narrow or setaceous, sometimes as long as or longer than the stem. Clusters of spikelets solitary and sessile or in an umbel of few rays. Involucral bracts 2 or 3 longer than the inflorescence. Spikelets linear, spreading, from a pale green to a rich brown, 3 to 6 lines long, scarcely above ½ line broad, with 12 to 20 or even more flowers, the rhachis not winged. Glumes rather narrow, prominently 3-nerved, the keel or dorsal nerve produced into a long recurved or spreading point, the sides bordered by a nerveless brown or hyaline margin terminating often abruptly below the recurved

point. Stamen usually 1. Style 3-cleft. Nut obovoid but narrower than in *C. squarrosus*, prominently 3-angled.—Bœckel. in Linnæa, xxxv. 496; *C. squarrosus*, F. Muell. Fragm. viii. 262 but not of Linn., and not the var. *stenocarpus*.

Queensland. King's Creek and Herbert Creek, *Bowman*.

The species is widely spread over tropical Asia and Africa, extending northwards to S. China, and is also abundant in South and Central America east of the Andes.

21. **C. squarrosus,** *Linn. Amœn. Acad.* iv. 303 *and Spec. Pl.* 66 *excl. syn. Pluken.*—A small tufted annual, the stem rarely above 4 in. and sometimes under 1 in. high. Leaves mostly shorter than the stem, in some specimens 1½ lines broad and tapering to a fine point, in others very narrow from the base. Spikelets numerous, in dense ovoid or globose heads either solitary and sessile or in an umbel of few rays, rarely 1 in. long. Involucral bracts 3 or 4, of which 1 or 2 much longer than the inflorescence. Spikelets flat, oblong or linear, 2 to 3 lines long, 10- to 20-flowered, the rhachis not winged. Glumes rather narrow, 5- or 7-nerved, tapering into a long recurved point, without any or scarcely any nerveless margin. Stamen usually 1. Style 3-cleft. Nut narrow-obovoid or oblong, prominently 3-angled, varying from rather broad and under half the length of the glume, to narrow and longer than the half.—*C. aristatus*, Rottb. Descr. et Ic. Pl. 23, t. 6, f. 1; Kunth, Enum. ii. 23; Bœckel. in Linnæa, xxxv. 500; *C. inflexus*, Muehl.; Kunth, l. c. 22; F. Muell. Fragm. viii. 262; *C. uncinatus*, R. Br. Prod. 215; *C. Brownei*, Steud. Syn. Glum. ii. 53.

N. Australia. Dampier's Archipelago, *Walcott*; Gulf of Carpentaria, *F. Mueller*.
Queensland. Endeavour River, *Banks and Solander*; various localities in North Queensland, *Armitage*, *Wuth*; beyond Mount Murchison, *Bonney*.
South or Central Australia. Charlotte Waters, *Giles*.

Var. *congestus*. Spikelets few-flowered, very densely crowded in nearly globular heads.—Dry Beef Creek, *Leichhardt*.

Var. *cylindraceus*. Spikelets 3- to 6-flowered, in dense oblong-cylindrical heads under ¼ in. long.—*C. aristatus*, F. Muell. Fragm. viii. 261.—Port Denison, *herb. F. Mueller*; Rockhampton and Herbert's Creek, *Bowman*.

The species is widely spread over East India, tropical Africa, North America and Mexico, extending down the Pacific side of the Andes to Chile, but not in South America east of the Andes. It was very well characterised by Linnæus and is represented by a good specimen in his herbarium. Unfortunately he added a reference to Plukenet which belongs to a very different plant with the narrow somewhat flexuose spikelets and winged rhachis of the *Papyrus* section. This species, of which a small fragment is laid down in herb. Linn. by the side of the true *C. squarrosus*, is the *C. maderaspatanus*, Willd. described as *C. squarrosus* by Rottboell, Kunth, Bœckeler and others. It is common in India but not yet found in Australia.

22. **C. difformis,** *Linn.; Kunth, Enum.* ii. 38.—Stems tufted, 6 in. to 1½ ft. high, rather slender. Leaves sometimes as long as the stem but usually shorter, and sometimes all reduced to loose sheaths. Spikelets very numerous, in dense globular heads of ¼ to ½ in. diameter, the heads in a loose umbel of few rays, rarely contracted into a compound cluster, the rays usually slender. Involucral bracts 1, 2 or 3, very

variable in breadth. Spikelets narrow-linear, flat, 1½ to 2 lines long, remarkable for the numerous very small almost orbicular and very obtuse glumes, at first of a rich brown, but becoming variegated by their pale or almost white margins, the rhachis not winged. Stamens 1 or 2. Style 3-cleft. Nut obovoid, acutely 3-angled, as long as the glume or nearly so.—Rottb. Descr. et Ic. Pl. t. 9, f. 2; Sibth. Fl. Gr. t. 46; Reichb. Ic. Fl. Germ. t. 284; Bœckel. in Linnæa, xxxv. 586; R. Br. Prod. 215; F. Muell. Fragm. viii. 262.

Queensland. Keppel Bay, *R. Brown*; Rockingham Bay, *Dallachy*; Rockhampton, *Bowman*, *Thozet*, *O'Shanesy* and others; Moreton Bay, *F. Mueller*, *Leichhardt* and others; beyond Mount Murchison, *Bonney*.

N. S. Wales. Grose River, *R. Brown*; in the interior *A. Cunningham*; New England, *C. Stuart*; Clarence River, *Wilcox*.

Victoria? Murray River, *F. Mueller*.

South or Central Australia. Charlotte Waters, *Giles*.

Widely spread over the tropical and subtropical regions of the Old World, extending northwards to the Mediterranean region, where however it is rare and generally replaced by the nearly allied *C. fuscus*.

23. **C. tetraphyllus,** *R. Br. Prod.* 214.—Stems tufted or from a creeping rhizome, rather slender but usually rigid, triquetrous, 1 to 1½ ft. high. Leaves shorter or longer, flat, obtuse or acute, but less contracted into a point than in most species. Spikelets in clusters of 3 to 6, in an umbel of few or rarely rather numerous rays, the longest 2 to 3 in., rarely reduced to a single cluster. Involucral bracts narrow and tapering into long points, 1, 2 or 3 much longer than the inflorescence. Spikelets almost black but variegated with white when the nuts show beyond the glumes, linear-lanceolate, more or less flattened, 3 to 6 lines long, about 1 line broad, 6 to 20-flowered, the rhachis not winged. Glumes rather broad, concave, faintly several-nerved, obtuse or the keel prominent in the upper part only and produced into a very short point. Stamens usually 3. Style 3-cleft. Nut broadly triangular, more or less dorsally compressed, as long as the glume and at length protruding on each side.—Kunth, Enum. ii. 27; Sieb. Agrostoth. n. 22; F. Muell. Fragm. viii. 264.

Queensland. Brisbane River, Moreton Bay, *F. Mueller*, *Leichhardt*, *C. Stuart* and many others.

N. S. Wales. Hunter's and Paterson's River, *R. Brown*; Newcastle, *Leichhardt*; New England, Hastings, Tweed, Macleay, Clarence, and Richmond Rivers, *C. Moore*, *Beckler*, *C. Stuart* and others.

Var. *monocephalus*. Inflorescence reduced to a single sessile simple or compound cluster of spikelets.—Hastings and Macleay Rivers, *C. Moore*.

24. **C. trinervis,** *R. Br. Prod.* 213.—A perennial or sometimes annual. Stems weak and slender, from under 6 in. to 1 ft. long below the inflorescence. Leaves flat but not above 1 line broad, the longest often nearly as long as the stem, but sometimes all reduced to sheathing scales with or without a very short lamina. Spikelets in clusters of 3 or 4 or rarely more, in a simple or irregularly compound umbel of a few slender

rays, the longest sometimes 4 to 6 in. long, sometimes all under 1 in. or the inflorescence reduced to a sessile compound cluster. Involucral bracts usually 3, of which 1 or 2 longer than the inflorescence, but sometimes all short. Spikelets linear or oblong, very flat, pale coloured, in some specimens 2 to 3 lines long and 8- to 12-flowered, in others lengthening to 6 to 9 lines with numerous flowers, and at length appearing pedicellate from the fall of the lower glumes, usually about 1 line broad or rather more, the rhachis not winged. Glumes rather broad, short, regularly spreading, giving the spikelet a pinnate appearance, more or less acuminate, the keel acutely prominent, with 1 more or less conspicuous nerve in the middle of each side. Stamens 2 or 3. Style 3-cleft. Nut rather broad, acutely or at length obtusely 3-angled, not half so long as the glume.—Bœckel. in Linnæa, xxxv. 503; *C. flaccidus*, R. Br. l. c.; Bœckel. l. c. 502; F. Muell. Fragm. viii. 267; *C. imbecillis*, *C. aquatilis*, *C. inundatus* and *C. breviculmis*, R. Br. l. c. 213, 214; *C. Lessonianus* and *C. macellus*, Kunth, Enum. ii. 29, 30, according to Bœckeler.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; M'Adam Range and Fitzmaurice River, *F. Mueller*; Port Darwin, *Schultz*, *n.* 313 (scarcely in flower, and therefore doubtful); between Norman and Gilbert Rivers, *Gulliver*.

Queensland. Endeavour River, *Banks and Solander*, *A. Cunningham*; Shoalwater Bay, *R. Brown*; Rockingham Bay, *Dallachy*; Lizard Island, *M'Gillivray*; Rockhampton and numerous localities in S. Queensland, *Thozet*, *Bowman*, *Leichhardt*, *F. Mueller* and many others.

N. S. Wales. Hunter's River, *R. Brown*; New England, *C. Moore*; Clarence River, *Wilcox*; near Bulli, *Johnson*.

Victoria? Murray River, *F. Mueller*.

I do not quite identify this species with any extra Australian one, but it is very closely allied to *C. compressus*, which is common in tropical aud subtropical regions. It is exceedingly variable in stature, in the degree of development of the inflorescence and in the number of flowers in the spikelets and consequently their shape. I have been unable to distribute the numerous forms before me into distinct varieties, but generally they may be placed in two series; one with long narrow spikelets and numerous flowers would include *C. aquatilis*, *C. imbecillis* and *C. trinervis*, Br., the other often a smaller or more slender plant, with broader shorter spikelets, fewer flowers and more spreading glumes would include *C. flaccidus*, *C. inundatus* and *C. breviculmis*. One of Cunningham's Endeavour River specimens looks at first sight very different, from the spikelets being only 1¼ to 2 lines long and 1 line broad with 8 to 12 flowers. A few specimens from the interior of N. S. Wales have a more rigid aspect, and some from Rockhampton have remarkably long spikelets with numerous flowers. All have the same pale 3-nerved glumes, though the lateral nerve is sometimes scarcely prominent.

25. **C. Haspan**, *Linn.*; *Kunth*, *Enum.* ii. 34.—Stems tufted or shortly creeping, 6 in. to above 1 ft. rarely 2 ft. high, acutely 3-angled or flat but usually weak. Leaves all reduced to sheathing scales, or with a flat lamina shorter than the stem. Spikelets small, few together in loose clusters in a simple or compound umbel of slender usually numerous rays, the longest 2 to 3 in. long or sometimes all short. Involucral bracts 2 or 3, shorter than the inflorescence or one rather longer, flat and rather broad. Spikelets linear, flat, acute, 2 or at length 3 or even 4 lines long, scarcely ½ line broad, of 12 to 20 or rarely

more flowers, the rhachis not winged. Glumes appressed but loosely imbricate, narrow, obtuse, or with the prominent keel produced into a short point, the sides brown or pale, obscurely nerved, Stamens usually 3. Style 3-cleft. Nut obovoid or almost globular, obtusely 3-angled, less than half the length of the glume.—Rottb. Descr. et Ic. Pl. t. 6, f. 2; Bœckel. in Linnæa, xxxv. 574; F. Muell. Fragm. viii. 260; *Scirpus autumnalis*, Rottb. Descr. et Ic. Pl. 58, t. 17, f. 3, not of Linn.; *Cyperus pulcherrimus*, Willd.; Kunth, Enum. ii. 35; Bœckel. in Linnæa, xxxv. 573; *C. platyculmis*, R. Br. Prod. 214, altered to *C. laticulmis*, Spreng. Syst. i. 228.

N. Australia. Brunswick Bay, *A. Cunningham;* Upper Victoria River and M'Adam Range, *F. Mueller;* Port Darwin, *Schultz*, n. 310; islands of the Gulf of Carpentaria, *R. Brown.*

Queensland. Cape York, *Daemel, M'Gillivray;* Lizard Island, *M'Gillivray;* Rockingham Bay, *Dallachy;* Rockhampton and neighbourhood, *Bowman* and others; Moreton Bay, *F. Mueller*, *C. Stuart* and others.

N. S. Wales. Tweed River, *Eaves.*

Abundant in the tropical regions of the New and the Old World, replaced in S. Africa by the closely allied but evidently distinct *C. denudata, Linn.*, but extending northwards in America to Florida, New Orleans and Mexico.

26. **C. concinnus,** *R. Br. Prod.* 214.—Stems rather slender, from under 1 ft. to 1½ ft. high. Leaves narrow but sometimes as long as the stem. Spikelets in clusters of 3 or 4, in a compound umbel of numerous slender but rather short rays. Involucral bracts 3 or 4, very narrow, 1 or 2 of them longer than the inflorescence. Spikelets very flat, of a rich brown but bordered by the light-coloured tips of the glumes, ovate-oblong or at length oblong-linear, 2 to 3 or rarely 4 lines long, usually above 1 line broad, with 12 to 20 or rarely more flowers, the rhachis prominently notched but not winged. Glumes neatly imbricate, obtuse or almost acute, with prominent almost hyaline keels and margins, the sides otherwise dark brown with inconspicuous nerves, or rarely wholly hyaline and only appearing brown from the anthers showing through. Stamens 3 with short filaments. Style 3-cleft. Nut broadly triquetrous much less than half the length of the glume.—F. Muell. Fragm. viii. 261.

Queensland. Broad Sound and Shoalwater Bay, *R. Brown;* Port Curtis, *Beckler;* Rockhampton and various localities in South Queensland, *Dallachy, Bowman, O'Shanesy* and others.

N. S. Wales. Northern interior near Mount Aiton, *A. Cunningham;* Liverpool Plains, *C. Moore;* New England, *C. Stuart.*

Victoria. Mount Hope, Snowy River and Creswick Creek, *F. Mueller.*

27. **C. filipes,** *Benth.*—Stems triquetrous, rigid, 1 to 3 ft. high, leafless in the specimens seen except a single sheath at the base with a flat erect obtuse lamina of about 2 in. Spikelets single on the filiform rays of a compound umbel, the primary rays numerous mostly 4 to 8 in. long, one or two spikelets sessile or nearly so in the centre of the umbel. Involucral bracts about 8, mostly about as long as the rays and 2 or 3 lines broad, 1 or 2 short and narrow. Spikelets linear, flat,

3 to 5 lines long and scarcely 1 line broad, brown, 20- to 30-flowered, the rhachis prominently notched but not winged. Glumes rather broad, obtuse or shortly and obtusely acuminate, the keel not very prominent, the sides 3- or 4-nerved without nerveless margins, 4 or more of the lower ones usually smaller and empty. Stamens 3, on short filaments. Style 3-cleft. Nut ovoid-oblong, obtusely 3-angled or dorsally flattened, as long as or longer than the glume.

N. S. Wales. New England and Macleay River, *C. Moore;* Clarence River, *Wilcox.* Notwithstanding the long nut this species appears to be most nearly allied to the following.

28. **C. pedunculosus,** *F. Muell. Fragm.* viii. 266.—Stems rather stout, triquetrous, from about 6 in. to 1½ ft. high. Leaves few, longer than the stem, flat, 3 to 4 lines broad. Spikelets in clusters of about 3 or 4, in a simple or slightly compound umbel of 6 to 12 rays, the longest 3 to 8 in. long. Involucral bracts 5 or 6 or sometimes more, as broad as or broader than the stem-leaves, and 1 to 3 of them much longer than the inflorescence. Spikelets linear-lanceolate, flat, green or light brown, 4 to 9 lines long, 1½ lines broad, with about 20 to 30 flowers, the rhachis prominently notched but not winged. Glumes lanceolate, incurved, loosely but regularly imbricate, not spreading, the keel prominent, the sides nerveless or very faintly several-nerved. Stamens 3, with short filaments. Style 3-cleft. Nut broad, prominently 3-angled, much less than half the length of the glume.

Queensland. Rockingham Bay, *Dallachy.*

This and the preceding species have much the habit of the South American *C. simplex,* H. B. et K., but are both abundantly distinct in several respects.

29. **C. vaginatus,** *R. Br. Prod.* 213.—Stems from a horizontal or creeping rhizome, rigid, terete or slightly striate, 1 to 3 ft. high, leafless except a few brown sheaths at the base, the innermost of which sometimes 3 to 4 in. long with a short erect lamina. Spikelets numerous in dense globular heads of about ½ in. diameter when fully out, in a simple umbel of several often many rays of ½ to 1½ in. or the inflorescence contracted into a sessile compound cluster. Involucral bracts usually 5 or 6, more nearly equal than in any other species, erect or spreading, usually rigid, 1 to 3 in. long. Spikelets very flat, of a rich brown, oblong lanceolate or linear, about 1 line broad, varying from 2 to 3 lines long with 12 to 20 flowers to 4 to 6 lines with 40 to 50 flowers, the rhachis not winged. Glumes closely imbricate but spreading, acute, the keel prominent and pale coloured, the sides brown and nerveless. Stamens 2 to 3. Style 3-cleft. Nut very prominently 3-angled, rather broad, acute, less than half the length of the glume.—Bœckel. in Linnæa, xxxv. 572.

N. Australia. Nichol Bay, *Herb. F. Mueller;* lagoons, Flinders River, *F. Mueller.*

Queensland. Plains of the Condamine, *Leichhardt;* various localities in South Queensland, *O'Shanesy,* and others.

N. S. Wales. Paterson's River, *R. Brown*; Lachlan and Macquarrie Rivers, *A. Cunningham*; New England, *C. Moore*, *C. Stuart*.

S. Australia, *Behr.*; Spencer's Gulf, *R. Brown*; Torrens River, *F. Mueller*; Central Australia, *Gosse's Expedition*.

W. Australia. Murchison River, *Oldfield*.

Var. *densiflorus*. Stems not so stout and more evidently striate. Involucral bracts much shorter. Heads of spikelets small and crowded into a dense compound sessile cluster.—*C. gymnocaulos*, Steud. Syn. Glum. ii. 12 (erroneously described as digynous); *C. cruciformis*, Bœckel. in Linnæa, xxxv. 572

Victoria. Lalbert Lake and Murray River, *F. Mueller*; Wimmera, *Dallachy*.

S. Australia. Port Lincoln, *Bowen*; Alice Springs, Central Australia, *Giles*.

W. Australia. *Drummond*, *n.* 63, 334, 942; Champion Bay, *Grey*.

F. Mueller, Fragm. viii. 261, refers this species to the South African *C. textilis*, Thunb., that species however has a much looser and more compound inflorescence, the involucral bracts longer and more numerous, and the glumes of a pale colour with hyaline margins. *C. vaginatus* is perhaps nearer to the *C. marginatus*, Thunb., but I think distinct from both.

In a few of Leichhardt's specimens and in one of Gosse's the spikelets are very long with numerous thin pale-coloured glumes scarcely keeled, but the flowers are all abortive and the spikelets therefore in an abnormal state.

80. **C. holoschœnus,** *R. Br. Prod.* 215.—Stems from a thick horizontal or creeping rhizome, 1 to 2 ft. high, obtusely 3-angled. Leaves rather narrow, sometimes nearly as long as the stem. Spikelets small, in dense globular clusters or heads 2 to 3 lines diameter, in an irregularly compound umbel of 4 to 8 or even more rays, the longest 2 to 3 in. long. Involucral bracts 3 or 4, narrow, 1 to 2 of them longer than the inflorescence, the heads or clusters subtended by glume-like bracts. Spikelets flat, pale brown, shortly lanceolate or oblong, 1 to 1½ lines long, and fully 1 line broad, with 5 to 8 or rarely more flowers, the rhachis not winged or with an exceedingly narrow border. Glumes loosely imbricate, obtuse or almost acute, of a thin pale texture, striate with 2 or 3 fine nerves on each side. Stamens 3. Style 3-cleft. Nut obtusely 3-angled, nearly or quite as long as the glume.—F. Muell. Fragm. viii. 262.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; Arnhem Land and Upper Victoria River, *F. Mueller*; between the Norman and Gilbert Rivers, *Gulliver*.

Queensland. Barcoo Downs, *Birch*.

81. **C. dactylotes,** *Benth.*—Stems usually rather stout and 2 to 3 ft. high, but sometimes more slender and scarcely above 1 ft., terete or obtusely 3-angled. Leaves rather long, but only sent with very few specimens. Spikelets numerous in dense clusters or heads, in a usually compound but very variable umbel, the longest rays often 6 in. long, the partial umbels very dense. Involucral bracts several, of which 2 to 4 longer than the inflorescence and 2 to 4 lines broad at the base. Spikelets linear, flat, very regular, usually 6 to 9 lines but sometimes at least 1 in. long, scarcely 1 line broad, of a light brown sometimes almost golden colour, with 30 to 50 or even more flowers, the rhachis not winged. Glumes loosely imbricate, not very broad, obtuse or the keel produced into a minute point, the sides more or less distinctly 2-

or 3-nerved, without scarious margins. Stamens 3. Style 3-cleft. Nut narrow, 3-angled, nearly as long as the glume.

N. Australia. Attack Creek, *M'Dougall Stuart.*

Queensland. Maranoa, *Woolls ;* Barcoo Downs. *Schmidt, Birch ;* Armadillo, *Barton.*

32. **C. Gilesii,** *Benth.*—Stems 6 in. to 1 ft. high, slender, slightly triquetrous. Leaves much shorter. Spikelets in dense clusters in a simple umbel of about 6 rays, the longer ones about 1 in. long, or the whole inflorescence condensed into a compound sessile cluster. Involucral bracts few, of which 1 or 2 longer than the inflorescence. Spikelets linear or linear-lanceolate, very flat, elegantly pinnate, of a pale brown, ½ to nearly 1 in. long, above 1 line broad, 20- to 40-flowered, the rhachis slender, not winged. Glumes loosely but regularly distichous, narrow, obtuse, but the pale-coloured or almost hyaline keel produced into a fine straight or recurved point, the sides very prominently 2- or 3-nerved, the lower glumes very deciduous, giving the older spikelets a pedicellate appearance, the 2 small ovate empty glumes remaining persistent at the base of the rhachis. Stamens 3. Style 3-cleft. Nut linear-oblong, more than half the length of the glume.

Central Australia. Charlotte Waters, *Giles ;* Mitchell District, *Herb. F. Mueller,* collector not named,

33. **C. fulvus,** *R. Br. Prod.* 215.—Stems from under 1 ft. to above 2 ft. high, obtusely 3-angled. Leaves narrow, sometimes as long as the stem. Spikelets 6 to 12 together in dense heads or clusters in a simple or compound umbel of 5 to 10 rays, the longest rarely 2 in. long. Involucral bracts 2 usually longer than the inflorescence and sometimes very long, with 1 or 2 short ones. Spikelets very spreading, linear-lanceolate, rather acute, flat but rather thick, of a golden brown or pale coloured, 2 to 3 or rarely 4 lines long, about 1 line broad, 8- to 12-flowered, the rhachis not winged. Glumes loosely imbricate or at length rather spreading, narrow, obtuse or almost acute, with 2 or 3 prominent nerves on each side of the keel. Style 3-cleft. Nut oblong, 3-angled, more than half the length of the glume.—F. Muell. Fragm. viii. 268 ; *C. Sieberi,* Kunth, Enum. ii. 96.

Queensland. East Coast, *R. Brown ;* Port Denison, *Fitzalan ;* Rockhampton and various localities in S. Queensland, *Bowman, O'Shanesy, Leichhardt* and others.

N. S. Wales, *Leichhardt, Sieber, n.* 630; Shoalhaven Gullies, *C. Moore ;* Camden and Richmond River, *Woolls ;* Gojinga Mountains, *Victorian Expedition.*

Central Australia. Charlotte Waters, *Giles.*

34. **C. carinatus,** *R. Br. Prod.* 216.—Stems 6 in. to 1½ ft. high, obtusely triquetrous. Leaves much shorter, crowded in the tufts, rather broad, tapering to a fine point. Spikelets in dense clusters or heads in an umbel of few rays, the longest 1 to 2 in. long. Involucral bracts 3 or 4, of which 1 or 2 longer than the inflorescence and 1 often very long. Spikelets spreading, linear or linear-lanceolate, flat but rather thick, with a loose pinnate aspect, 4 to 6 lines long or when old

rather longer, nearly 2 lines broad, 10- to 30-flowered, the rhachis not winged or scarcely perceptibly bordered. Glumes not closely imbricated, short and rather broad, spreading, obtuse, the keel prominent and often produced into a short straight or recurved point, the sides 3- or 4-nerved. Stamens 3. Style 3-cleft. Nut obovate-oblong, 3-angled, more than half the length of the glume.

N. Australia. North Coast, *R. Brown*; M'Adam Range, *F. Mueller*; between Norman and Gilbert Rivers, *Gulliver*.
Queensland. Springsure, *Wuth*.
N. S. Wales. Liverpool range, *Leichhardt*; New England, *C. Stuart*; Mudgee, *Taylor*.

The species is very near *C. fulvus* with which it is united by *F. Mueller*, but the glumes are much shorter and broader as well as looser in the spikelets, giving the inflorescence a very different aspect approaching that of *C. alterniflorus*.

35. **C. alterniflorus**, *R. Br. Prod.* 216.—Stems rather stout, acutely 3-angled, 2 to 3 ft. high. Leaves often longer than the stem, 2 to 4 lines broad at the base, with very scabrous edges. Spikelets densely clustered as in the preceding species, but the common rhachis often slightly elongated, the clusters becoming short dense spikes, in a compound umbel of 6 to 10 rays, the longest 3 to 4 in. long, or all short and dense. Involucral bracts 1 or 2 very long, sometimes near 2 ft. and very scabrous like the leaves, with 1 or 2 short ones. Spikelets spreading, of a rich or a pale brown, linear, flat, 4 to 10 lines long, nearly 1½ lines broad, 10- to 30-flowered, the rhachis not winged. Glumes narrow, spreading and very loosely imbricate, rather acute, the keel prominent, with 3 or 4 nerves on each side. Stamens 2 or 3. Style usually 3-cleft. Nut narrow, 3-angled, more than half the length of the glume.—*C. pictus*, Steud. Syn. Glum. ii. 43.

Queensland. Shoalwater Bay, *R. Brown*; Gracemere, *O'Shanesy*; King's Creek, *Bowman* (with spikelets above 1 in. long and 50- to 60-flowered).
S. Australia. Wulpena in the interior, *F. Mueller*.
W. Australia. *Drummond, n.* 75 *and* 335.

The species is allied to *C. carinatus* but readily known by the stature, acute-angled stem and long scabrous leaves and involucral bracts. The *C. pictus* was founded upon the western specimens, but upon a careful comparison I am unable to distinguish them from the eastern ones.

36. **C. pilosus**, *Vahl; Kunth, Enum.* ii. 80.—Stems from a thick rhizome 1 to 2 ft. high or rather more, stout and acutely 3-angled. Leaves sometimes as long as the stem and rather broad. Spikelets loosely spicate along the upper part of the rays of a rather compact umbel of 7 to 10 or more rays, the longest 2 to 3 in. long, the rhachis of the spikes angular and minutely hairy, the only instance of pubescence observed in the genus. Involucral bracts 4 or 5, of which one often very long and the 2 outer ones broad. Spikelets very spreading, of a pale brown, flat, linear-lanceolate, about 4 lines long, 10- to 16-flowered, the rhachis not winged or the angles with an exceedingly narrow border. Glumes pinnately spreading, rather acute, with a green keel and usually

2 nerves on each side. Style 3-cleft. Nut broad, acutely 3-angled, less than half the length of the glume.—Bœckel. in Linnæa, xxxv. 598; F. Muell. Fragm. viii. 260.

Queensland. Brisbane River, *F. Mueller*. Widely spread over tropical Asia.

37. **C. ornatus**, *R. Br. Prod.* 217.—Stems rather stout, 1 to 3 ft. high, obtusely triquetrous. Leaves long, but usually shorter than the stem. Spikelets loosely spicate or almost racemose, occupying nearly the whole of the secondary rays and some of the primary ones of a slightly compound umbel, the longest rays 3 to 4 in. long. Involucral bracts usually 2 or 3 much longer than the inflorescence, besides 1 or 2 short ones. Spikelets spreading, sessile or stipitate, of a rich brown, linear-lanceolate, 5 to 6 lines long, or in some Indian specimens twice that length, 1½ lines broad, 12- to 20-flowered in Brown's specimen, 30- to 40-flowered in some Indian ones, the rhachis angled and notched but not winged. Glumes navicular but obscurely keeled, at first imbricate at length slightly spreading, obtuse or scarcely acute, of a uniform shining brown, but bordered by a white hyaline margin sometimes very narrow, sometimes broad at the apex. Style 3-cleft. Nut obovoid, triquetrous, about half the length of the glume.—*C. procerus*, Vahl according to Kunth, Enum. ii. 72, but not of Rottboell; *C. Heynei*, Bœckel. in Linnæa, xxxv. 600.

N. S. Wales. Hawkesbury, *R. Brown*. Found also in the Indian Peninsula and in Ceylon.

The species closely resembles a digynous species of the sections *Pycreus* generally referred to *C. puncticulatus* Vahl, and agreeing with his description, he does not however mention the number of style-branches nor the shape of the nut. Rottboell's *C. procerus* is probably a mere variety of *C. rotundus*.

38. **C. Iria**, *Linn.; Kunth, Enum.* ii. 38.—Stems tufted, 6 in. to 1½ ft. high or rarely more, triquetrous. Leaves flaccid, shorter than the stem or rarely one longer. Spikelets loosely and irregularly spicate along the rays of a simple or compound umbel, either occupying nearly the whole ray or almost crowded into a terminal cluster, the longer rays from 1 to 3 in. Involucral bracts 3 or 4, of which 1 or 2 sometimes longer than the inflorescence. Spikelets linear-oblong, obtuse, flat, 2 to 5 lines long, 1 to 1½ lines broad and 6- to 12-flowered in the common form, the rhachis not winged. Glumes loosely imbricate or at length distant, very obtuse, of a pale brown or yellowish green, the keel prominently 3- or 5-nerved, the sides broad and nerveless. Stamens 2 or 3, the filaments often united in a prominent hypogynous ring at the base. Style 3-cleft. Nut obovoid, prominently 3-angled, about as long as the glume.—Bœckel. in Linnæa, xxxv. 595; F. Muell. Fragm. viii. 266.

N. Australia. Sturt's Creek, *F. Mueller*.

Queensland. Port Denison, *Fitzalan*; Bowen Down, *Birch*.

Var. *flavescens*. Spikelets fewer in the spike but longer, with 12 to 16 flowers, assuming nearly the aspect of *C. flavescens*, although in some specimens 1 or 2 of the umbel-rays break out into the ordinary longer spike with few-flowered spikelets.

Central Australia, *Gosse;* Charlotte Waters, *Giles;* near Mount Murchison, *Bonney.*

The species is abundant in tropical Asia, extending northwards to China and Japan, and westward to East tropical Africa.

39. **C. eleusinoides,** *Kunth, Enum.* ii. 39.—Stems from a hard rhizome 2 ft. high or more, acutely 3-angled. Leaves with long sheaths covering the lower part of the stem, the lamina sometimes short narrow and rigid, sometimes broad and as long as the stem. Spikelets in dense close spikes occupying the whole or nearly the whole of the partial rays of a compound umbel which is usually narrow and irregular, the longer primary rays often 6 to 8 in. long and very erect. Involucral bracts few, 1 or 2 much longer than the inflorescence. Spikelets linear, flat, regularly pinnate, pale coloured, 4 to 5 or rarely 6 lines long, rather above 1 line broad, with 10 to 16 or rarely more flowers, the rhachis not winged or with a very narrow border. Glumes spreading, loosely imbricate or rather distant, somewhat scarious and often notched at the top, the prominent keel produced into a short point, and 2, 3 or rarely 4 nerves on each side. Style 3-cleft. Nut obovoid or oblong, prominently 3-angled, more than half the length of the glume.—Bœckel. in Linnæa xxxv. 596; *C. xanthopus,* Steud. in Flora, 1842, 595; F. Muell. Fragm. viii. 264 (partly).

N. Australia. Nebo, *Gulliver.*
Queensland. Port Denison, *Fitzalan;* Rockhampton and neighbourhood, *Dallachy, O'Shanesy;* Springsure, *Wuth;* Lockyer River, *Hartmann.*

The species is widely spread over East India and tropical Africa.

40. **C. distans,** *Linn. f.; Kunth, Enum.* ii. 93.—Stems 1 to 2 ft. high, slender or rather stout, triquetrous. Spikelets at first in narrow dense spikes, expanding into loose simple or branched racemes, in a simple or compound umbel, the rays few or many, slender or sometimes filiform. Involucre of few narrow bracts, 1 or 2 longer than the inflorescence. Spikelets very narrow, linear, ½ to 1 in. long, loosely spreading when fully out, 10- to 20-flowered, the rhachis filiform, not winged. Glumes distant, appressed to the rhachis or rarely spreading, narrow, obtuse, the keel prominent with 1 or 2 nerves on each side, the broad or narrow margins pale and nerveless. Style 3-cleft. Nut oblong, 3-angled, nearly or quite as long as the glume.—Jacq. Ic. Rar. t. 299; Beauv. Fl. Ow. et Ben. t. 20; Bœckel. in Linnæa, xxxv. 612; F. Muell. Fragm. viii. 266; *C. elatus,* Rottb. Descr. et Ic. Pl. t. 10, not of Linn.

Queensland. Herbert's River, *Dallachy, Bowman;* Rockingham Bay, *Dallachy;* Rockhampton, *O'Shanesy.*

This species has something of the habit of a *Diclidium,* but the rhachis of the spikelets is not at all winged. It is very widely spread over the warmer regions of the New and the Old World.

C. subulatus, Sieb. Agrostoth. n. 145 is referred here by Kunth, but the synonymy is doubtful. All the specimens I have seen are in a very imperfect state, it certainly however is not *C. subulatus* Br., and is very probably West Indian.

SECTION IV. PAPYRUS, Nees.—Spikelets flat or terete, with navicular or concave glumes, the angles of the rhachis bordered by scarious hyaline wings, decurrent from the margins of the glume immediately above, and frequently (but not always in the same species) becoming more or less detached from the rhachis as the flowering advances, then assuming the appearance of small scales one on each side of the ovary and sometimes described as such. Style 3-cleft. Nut equally 3-sided or rarely (in *C. tegetiformis*) dorsally compressed.

41. **C. tegetiformis**, *Roxb.; Kunth, Enum.* ii. 56.—Rhizome creeping. Stems stout, 3 to 5 ft. high, triquetrous, the angles often acute in the upper part, leafless except the long loose sheathing scales at the base, the uppermost sometimes produced into a short lamina. Spikelets numerous and shortly spicate, in a compound umbel usually compact, the longer rays scarcely 2 in. long, but sometimes larger and looser. Involucral bracts few, 2 usually longer than the inflorescence and rather broad. Spikelets linear, not much flattened, 5 to 8 lines long, about 1 line broad, 16- to 24-flowered, the rhachis bordered by wings becoming frequently detached. Glumes ovate-oblong, obtuse, concave, scarcely keeled, the nerves very obscure, brown with pale but not hyaline margins. Style 3-cleft. Nut oblong, about half as long as the glume, more or less flattened, the inner face next the rhachis, the back convex but scarcely angled.—*C. Pangorei*, Hook. f. Fl. Tasm. Præf. 47, as to the Australian plant not of Rottb.; *C. enodis*, Bœckel. in Linnæa, xxxvi. 271; *C. spaniophyllus*, F. Muell. Fragm. viii. 260, not of Steud.

N. Australia. Lower Victoria River, *F. Mueller.*

The species is also in East India. It has some of the characters of the section *Juncellus* but is too closely allied to the following two species to be separated from them. The *C. spaniophyllus* Steud. is the *C. malaccensis* Lam., which has similar glumes but a leafy stem, the rhachis of the spikelets not winged and equally 3-angled nuts.

42. **C. articulatus**, *Linn.; Kunth, Enum.* ii. 53.—Rhizome often stoloniferous. Stems 1 to 2 ft. high, terete, marked with transverse septa which give it an articulate appearance, either leafless or the longest of the sheaths at the base produced into a short lamina. Spikelets 16 to 20 or more in loose clusters or short spikes in a simple or compound umbel of several very unequal rays, the longest 2 to 3 in. long. Involucral bracts 1 to 3, very short, linear-lanceolate or lanceolate. Spikelets linear, acute, slightly flattened, usually pale brown, varying from under ½ in. to above 1 in. long, rarely 1 line broad, with from 18 or 20 to twice that number of flowers, the rhachis bordered by hyaline wings often at length deciduous. Glumes rather narrow, obtuse or rather acute, obscurely 3- or 5-nerved, the keel not very prominent. Style 3-cleft. Nut less than half the length of the glume, rather broad, triquetrous.—Bœckel. in Linnæa, xxxvi. 274.

N. Australia. Port Essington, *Armstrong.* Widely spread over tropical Asia, Africa and America, extending to the southern States of the N. American Union.

43. **C. diphyllus,** *Retz, according to Bœckeler, in Linnæa*, xxxvi. 278. Very closely allied to *C. articulatus*, and perhaps a variety, differing chiefly in the stem which is usually taller and stouter and shows no traces of the transverse septa or so-called articulations. The other characters are the same as in *C. articulatus*, the inflorescence as loose or sometimes close and compact, the spikelets, glumes, flowers and nuts the same, and the involucral bracts equally short.—*C. Kœnigii*, Vahl; Kunth, Enum. ii. 54; *C. corymbosus*, Hook. f. Fl. Tasm. Præf. 47 as to the Australian plant, not of Rottb.

N. Australia. Port Essington, *Armstrong*.
Central Australia, *Gosse*.

Var. *elatior*, a stouter plant with a prominently 3-angled stem and 1 or 2 of the involucral bracts rather longer than the inflorescence.

Queensland. Rockhampton, *O'Shanesy*.

The species extends over a great part of East India. The var. *elatior* approaches the *C. corymbosus*, Rottb., also East Indian, but that species has much more developed involucral bracts as well as some other minor differences.

44. **C. rotundus,** *Linn.; Kunth, Enum.* ii. 58.—Rhizome creeping or stoloniferous, swelling here and there into tunicated tubers, the scales when worn away leaving annular scars or zones. Stems rather slender, usually 1 to 1½ ft. high, but sometimes short, triquetrous towards the top. Leaves rather narrow, much shorter than the stem, the sheaths often long and loose. Spikelets usually 6 to 10 together in clusters or short spikes in an umbel of few rays, the outer ones sometimes slender and 2 or 3 in. long but more frequently the umbel rather dense and sometimes almost contracted into a compound cluster. Involucral bracts few, 1 or 2 longer than the inflorescence. Spikelets usually of a rich brown, linear, acute, compressed but not very flat, usually about 5 or 6 lines long and rather above 1 line broad, with 12 to 20 flowers, but varying to a much greater length, the rhachis slightly flexuose and bordered by rather broad hyaline wings either persistent or at length deciduous. Glumes imbricate, not very broad, obtuse or rather acute, more or less distinctly several-nerved, with a prominent keel usually green. Stamens 3. Style 3-cleft. Nut obovoid, 3-angled, less than half the length of the glume.—R. Br. Prod. 216; Sieb. Agrostoth. n. 112; F. Muell. Fragm. viii. 269; Bœckel. in Linnæa, xxxvi. 283; *C. hexastachyus*, Rottb. Descr. et Ic. Pl. 28, t. 14, f. 2; *C. littoralis*, R. Br. Prod. 216; Sieb. Agrostoth. n. 109.

N. Australia. Islands of the north coast, *R. Brown;* Arnhem Land, *F. Mueller*.

Queensland. Brisbane River, Moreton Bay, Rockhampton and numerous other localities in South Queensland, *F. Mueller*, *O'Shanesy*, *Mitchell* and many others.

N. S. Wales, Port Jackson to the Blue Mountains, *R. Brown*, *Woolls* and others; New England, *C. Stuart;* in the interior to the north west, *A. Cunningham* and others; and to the Murray and Darling Rivers, *F. Mueller*, *Dallachy*, and others.

Victoria. Murray River, *F. Mueller.*
Central Australia, Charlotte Waters and Alice Springs, *Giles.*
W. Australia. Murchison River, *Oldfield.*

In some luxuriant specimens from Queensland as in some Indian ones, the stem is 2 ft. high. the umbel long and compound, the outer rays 3 to 6 in. long, the spikelets at length nearly 1 in. long with 20 to 30 flowers; in other smaller specimens from Dampier's Archipelago, *Walcot,* and from Central Australia the spikelets are fully 1 in. long; in others again from various localities the spikelets are rather small and the infloresence very irregular as in *C. longus,* but the shape of the spikelets and of the glumes are those of *C. rotundus.* The following varieties are at first sight more distinct, but pass gradually into the more typical forms:—

Var. *carinalis.* Spikelets rather long, the keel of the glumes green, broad and very prominent, sometimes winged.—Rockingham Bay, *Dallachy.*

Var. *pallidus.* Spikelets short in loose spikes, very pale-coloured, the glumes almost hyaline.—Cygnet Bay, *A. Cunningham,* Tambo in Queensland, *Wuth.* This variety passes into, if it be not identical with, the European *C. esculentus,* Linn.; Kunth, Enum. ii. 61. To it belongs also *C. scariosus,* R. Br. Prod. 216, as to one sheet of his specimens labelled N. coast, another sheet from the east coast is more like the common *C. rotundus,* though with smaller spikelets. The third sheet, from the Gulf of Carpentaria, belongs perhaps to the *C. carinatus,* the rhachis of the spikelets is not winged.

The species is abundantly spread over the tropical and temperate regions of the New and the Old World, varying in many places almost as much as in Australia and sometimes difficult to distinguish from *C. esculentus,* or from *C. longus,* but I do not think that the true *C. longus* has yet been detected in Australia.

C. Luerssenii, Bœckel. in Flora, 1875, 86, from Port Denison, *Amalia Dietrich,* must be very near some of the slender drawn-up specimens of *C. rotundus.* Bœckeler places it next to *C. dilutus,* Vahl, but describes a very different inflorescence and structure. Stem slender, 1 to 1½ ft. high. Leaves few, short, the lower ones reduced to sheaths. Umbel simple of 4 or 5 filiform rays, 2 to 3 in. long. Spikelets alternate at the end of the rays, 13 to 16 lines long and ½ line broad, with 16 to 24 flowers. Glumes green and several-nerved on the back, purplish on the sides. Nut scarcely half their length.

45. **C. stenostachyus,** *Benth.*—Rhizome thick and horizontal or creeping. Stems 2 to 3 ft. high. Leaves shorter, with rather long loose sheaths. Spikelets in clusters or short spikes in a rather compact umbel of several unequal rays, the longer ones 2 to 3 in. long and often bearing a secondary but dense umbel. Involucral bracts few, all shorter or one longer than the inflorescence. Spikelets linear, very flat, of a rich brown, 4 to 8 lines long, under 1 line broad, with 16 to 30 flowers, the rhachis bordered by scarious wings. Glumes not broad, obtuse or the keel produced into a very short point, with 1 or 2 prominent nerves on each side, the brown nerveless margin usually rather broad. Stamens 3. Style 3-cleft. Nut obovoid, obtuse, triquetrous, not quite half the length of the glume.

W. Australia. *Drummond, n.* 935. The inflorescence and many characters are those of *C. rotundus,* but it is a much taller plant, and the scarcely acute crowded spikelets are narrower and yet much flatter than ever observed in that species.

46. **C. congestus,** *Vahl; Kunth, Enum.* ii. 87.—Stems rather

stout, 1 to 2 ft. high, acutely 3-angled in the upper part. Leaves shorter than the stem, with rather long sheaths, the lamina often 2 lines broad, with long points. Spikelets numerous, in very dense short spikes ¾ to 1 in. diameter, in an umbel of 3 to 6 or rarely more rays, the longest 3 to 4 in. long, or the whole inflorescence reduced to a dense sessile compound cluster. Involucral bracts several, of which 2 or 3 longer than the inflorescence and the outer one sometimes 2 to 3 lines broad; the bracts subtending the spikelets hyaline and persistent. Spikelets linear, spreading, brown, slightly flattened, 6 lines long or rather more, and about 1 line broad when fully out, with 10 to 16 or rarely more flowers, the rhachis bordered by scarious wings often partially deciduous. Glumes loosely imbricate but scarcely spreading, obtuse or almost acute, keeled, with 3 or 4 nerves on each side. Stamens 3. Style 3-cleft. Nut broadly oblong, triquetrous, not quite half the length of the glume.—F. Muell. Fragm. viii. 269; *C. carinatus*, Nees in Pl. Preiss. ii. 72, not of R. Br.

N. S. Wales. Paramatta and Camden County, *Woolls*.
S. Australia. King George's Sound, and neighbouring districts, *Oldfield*, *Maxwell* and others; Swan River, *Drummond*, *Preiss*, *n.* 1812.

The species is chiefly South African, it is very near *C. rotundus*, but appears constantly distinct. The West Australian specimens quite agree with the African ones, the eastern ones, of which I have seen but very few, may require further comparison.

47. **C. subulatus,** *R. Br. Prod.* 217.—Stems from a creeping rhizome rather slender, under 1 ft. high in the specimens seen. Leaves very narrow, often as long as the stem. Spikelets in dense clusters or short spikes in an umbel of few rays. Involucral bracts very narrow, almost filiform, 1 or 2 of them longer than the inflorescence. Spikelets brown, linear, acute, not very flat, 6 to 8 lines long and scarcely 1 line broad, 12- to 20-flowered, the rhachis bordered by hyaline wings. Glumes rather narrow, erect but not very closely imbricate, acute or scarcely obtuse, the keel green, 3-nerved, or sometimes 5-nerved, the sides brown and nerveless. Style 3-cleft. Nut rather broad, triquetrous, more than half the length of the glume.

N. S. Wales. Port Jackson, *R. Brown*. The spikelets are nearly those of *C. rotundus*, but narrower and in denser clusters, and the specios differs in foliage both from that and from *C. congestus*.

Var. *confertus*. Umbel rays few and short.

S. Australia. Lake Eyre, *Andrews*; Alice Springs, Central Australia, *Giles*.

48. **C. sporobolus,** *R. Br. Prod.* 215.—Stems usually rigid but not very stout, obtusely triquetrous, from under 1 ft. to 1½ ft. high. Leaves much shorter. Spikelets in little globular heads or clusters in a compound umbel of 5 to 10 very unequal rays, the longer ones 1 to 3 in. long, the clusters or heads at first 2 to 3 lines diameter but expanding to 4 or 5 lines. Involucral bracts few, of which 2 or 3 much

longer than the inflorescence and sometimes very long. Spikelets spreading, flat, rarely above 2 lines long, with 5 to 8 flowers, the rhachis very short, but more or less distinctly bordered by hyaline wings. Glumes rather narrow, spreading, strongly several-nerved, the keel sometimes produced into a minute point. Style 3-cleft. Nut oblong, triquetrous, more than half as long as the glume.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* N. W. coast, *Hughan;* Upper Victoria River, *F. Mueller;* Port Darwin, *Schultz*, n. 791; Sweers Island, *Henne;* the latter specimens with rather larger spikelets and very spreading glumes.

C. sexflorus and *C. microcephalus*, R. Br. l. c. both from the same localities in the Gulf of Carpentaria, appear to me to be slight varieties of *C. sporobolus*, with smaller heads of spikelets and fewer flowers in each spikelet.

49. **C. angustatus,** *R. Br. Prod.* 214.—Stems rather slender, obtusely triquetrous, 1 to 3 ft. high. Leaves narrow, mostly shorter than the stem. Spikelets 4 to 10 together in close clusters in a compound spreading umbel of 6 to 10 or even more slender rays, the longest often 3 or 4 in. long. Involucral bracts narrow, 1 or 2 longer than the inflorescence and sometimes very long. Spikelets very spreading, linear, scarcely flattened, rather acute, brown or pale coloured, 4 to 8 lines long when fully out and scarcely above ½ line broad, with 10 to 20 flowers, the rhachis bordered by narrow hyaline wings. Glumes appressed or rarely slightly spreading, rather narrow, the keel produced into a small point, the sides striate with 2 or 3 prominent nerves. Style 3-cleft,. Nut narrow-oblong, sometimes slightly clavate, triquetrous, nearly as long as the glume.—Bœckel. in Linnæa, xxxviii. 366.

N. Australia. North coast, *R. Brown;* Port Darwin, *Schultz*, *n.* 259.
Queensland. King's Creek, *Bowman;* Gracemere, *O'Shanesy;* Bowen Downs, *Birch.*

50. **C. Novæ-Hollandiæ,** *Bœckel. in Linnæa,* xxxvi. 344.—Rhizome thick and hard. Stems stout, acutely 3-angled in the upper part, 3 to 4 ft. high. Leaves often longer than the stem, the sheath long, the lamina keeled below flat upwards and 2 to 3 lines broad. Spikelets numerous, in dense clusters or heads in a rather large compound umbel of 10 to 12 or more rigid rays the longest 3 or 4 in. long, the partial umbels dense. Involucral bracts few, 1 or 2 often 1 to 2 ft. long, and 2 to 3 lines broad, with very scabrous edges, the bracts under the partial umbels small and scarious. Spikelets spreading, usually light brown, linear, not very flat, rather acute, 4 to 6 lines long, scarcely ½ lines broad, 10- to 20-flowered, the rhachis bordered by narrow hyaline wings. Glumes loosely imbricate but not spreading, rather narrow, obtuse or the keel produced into a very short point, the sides faintly nerved, brown with a pale margin. Style 3-cleft. Nut very narrow, triquetrous, as long as the glume or nearly so.

Queensland. Rockingham Bay, *Dallachy;* Rockhampton, *Thozet.*

C. inornatus, Bœckel. in Flora, 1875, 86, from Port Mackay, *Amalia Dietrich*, is placed by Bœckeler immediately before *C. Novæ-Hollandiæ*. In the long diagnosis including many characters common to the whole genus, I see nothing to distinguish it from that species.

51. **C. Gunnii,** *Hook. f. Fl. Tasm.* ii. 80, *t.* 140.—Stems usually rigid but not very stout, obtusely triquetrous, from under 1 ft. to 2 or sometimes 3 ft. high. Leaves few, sometimes as long as the stem, much narrower than in *C. lucidus*. Spikelets from 8 or 10 to twice that number, in dense globular clusters or heads in a simple or compound umbel of 6 to 10 rays, the longest 1 to 2 or rarely 3 in. long. Involucral bracts few and narrow, 1 or 2 from 6 in. to above 1 ft. long. Spikelets lanceolate, acute, flat, of a rich brown, 2 to 4 lines long and above 1 line sometimes nearly 2 lines broad at the base, 8- to 12-flowered, the rhachis bordered by narrow hyaline wings. Glumes loosely imbricate or at length spreading, rather acute, keeled, with 2 or 3 prominent nerves on each side. Style 3-cleft. Nut narrow, prominently 3-angled, not much shorter than the glume.—*C. compositus*, Bœckel. in Linnæa, xxxvi. 333, not of R. Br.; *C. nodulosus*, F. Muell. in herb. plur.

N. Australia. Dampier's Archipelago, *A. Cunningham*, *Walcot.*

N. S. Wales. In the interior, *A. Cunningham;* New England, *C. Stuart;* Armidale, *Parrott;* Liverpool Plains, *C. Moore.*

Victoria. Goulburn and Purdie's Rivers, *F. Mueller;* Wendu Vale, *Robertson;* Wimmera, *Dallachy.*

Tasmania. Near Launceston, *Gunn.*

S. Australia, Mount Barker, *F. Mueller.*

F. Mueller unites this species with the *C. lucidus* to which it is nearly allied, but appears to me to be constantly different in inflorescence as well as in general habit. A specimen from Port Jackson in herb. R. Brown, there named *C. scaber*, but evidently not described in the Prodromus, appears to be the *C. Gunnii.*

C. Sieberi, Kunth, Enum. ii.96, founded on Sieber's specimens of his *C. microcephalus*, Fl. Nov. Holl. n. 630, which I had at first, from Kunth's and Bœckeler's descriptions, referred to *C. Gunnii*, would appear, from a specimen I have since seen, to be rather a form of *C. fulvus*.

C. Dietrichiæ, Bœckel. in Flora, 1875, 87, from Port Mackay, *Amalia Dietrich*, must also be very near if not identical with *C. Gunnii*. The inflorescence, the spikelets collected in dense globose heads, the winged rhachis, the long narrow nuts, answer perfectly well, except that the rays are described as more slender than I have seen them, and I do not understand the expression 'spiculis setaceo-tenerrimis."

52. **C. lucidus,** *R. Br. Prod.* 218.—Stems stout, from 1 to 3 or even 4 ft. high, prominently 3-angled. Leaves often longer than the stem and ¼ to ½ in. broad. Spikelets in spikes occupying the whole or the upper part of the secondary rays of a large and compound umbel of many rays, the longer ones sometimes 8 or 9 in. long, the spikes sometimes rather loose and 1½ to 2 in. long, sometimes shorter and dense, the rays of the infloresence both general and partial often not closely umbellate, the common rhachis more or less produced. Involucral bracts 3, 4 or more, the outer ones often very broad and above 1 ft.

long. Spikelets very spreading, of a rich brown, linear, flattened, acute, 4 to 6 or at length 7 or even 8 lines long, with 3 to 8 or rarely more flowers; the rhachis bordered by narrow hyaline wings. Glumes erect but not closely imbricate and sometimes at length distant, rather narrow, obtuse, the keel usually but not always pale coloured, the sides 2- or 3-nerved. Style 3-cleft. Nut oblong, prominently 3-angled, acuminate, rather shorter than the glume.—Bœckel. in Linnæa, xxxvi. 355; F. Muell. Fragm. viii. 270, partly; *C. sanguineofuscus*, Nees in Ann. Nat. Hist. ser. I, vi. 46, as to the Tasmanian plant; Hook. f. Fl. Tasm. ii. 80, t. 139.

Queensland. Moreton Bay, *F. Mueller*, *Leichhardt* and others; Boyne River, *Hartmann*.

N. S. Wales. Port Jackson, *R. Brown*, *Woolls;* Clarence River, *Wilcox;* Hastings River, *Leichhardt*, *C. Moore*.

Victoria. Yarra River. *F. Mueller;* Wendu Vale, *Robertson*.

Tasmania. Common on river banks and in marshy places throughout the Island, *J. D. Hooker*.

The species appears to be limited to Australia, the Brazilian plant referred to it by Nees is evidently the same as *C. densiflorus*, Mey. or *C. Schraderianus*, Mart. referred by Nees to *C. mundulus*, Kunth, but incorrectly so according to Bœckeler. This Brazilian species is closely allied to the W. Indian *C. purpurascens*, Vahl, differing from *C. lucidus* in the shorter rather flatter spikelets, more numerous flowers, and shorter less acuminate nuts. Grisebach in his Flora of the British West Indies has unfortunately confounded this *C. purpurascens* with the very different *C. brunneus*, Sw. *C. acutus*, R. Br. Prod. 217, appears to be only a rather small state of *C. lucidus*, with fewer rather longer spikelets.

53. **C. pennatus**, *Lam.; Kunth, Enum.* ii. 80, *but not of Bœckeler.*—Stems 1½ to 2½ ft. high, obscurely triquetrous or almost terete. Leaves complicate at the base with rather long sheaths, ending in long slender points often exceeding the stem. Spikelets in dense spikes of ½ to 1 in. in a compound umbel of many rays, the outer ones often 3 to 6 in. long. Involucral bracts 3 to 6, rather rigid, very scabrous on the edges, the outer ones often 1½ ft. long. Spikelets very spreading, oblong-lanceolate, thick but more or less flattened, 3 to 5 lines long, 1½ to 2 lines broad, pale coloured, 4- to 8-flowered, the rhachis bordered by broad hyaline wings. Glumes closely imbricate, broad, rather acute, concave, slightly keeled only above the middle, very obscurely nerved. Style 3-cleft. Nut obovoid, prominently 3-angled, nearly half the length of the glume.—F. Muell. Fragm. viii. 263; *C. canescens*, Vahl; Bœckel. in Linnæa, xxxvi. 340; *C. ventricosus*, R. Br. Prod. 217.

W. Australia. Fitzmaurice and Upper Victoria Rivers, *F. Mueller;* Port Darwin, *Schultz*, *n.* 159.

Queensland. Broad Sound, *R. Brown;* Port Molle, *M'Gillivray;* Cape York, *Daemel*; Rockhampton, *Thozet*, *O'Shanesy* (with rather longer spikelets); Broadwater, *Eaves*.

Spread over East India, the Malayan Archipelago and the Pacific Islands. It has been identified as Lamarck's *C. pennatus* by Kunth, Decasine and others, and agrees perfectly with Poiret's original description, Dict. vii. 240. Bœckeler by some mistake refers Brown's *C. ventricosus* to the American and West African *C. ligularis*, Linn.

C. ochroleucus, Bœckel. in Flora, 1875, 85, from Lake Elphinstone, *Amalia Dietrich*, is placed by Bœckeler next to *C. pennatus* (*C. canescens*) and the description he gives, taken from a specimen in bud, shows no character by which I can distinguish it from that species.

54. **C. exaltatus**, *Retz.; Kunth, Enum.* ii. 70.—Stems stout, 1 to 3 ft. high. Leaves often longer, rather broad, but tapering into a long narrow point. Spikelets numerous, in loose spikes of 1 to 2 in. in a large usually compound umbel of many rays, the longer ones often 3 or 4 in. long. Involucre of few bracts, 1 or 2 much longer than the inflorescence. Spikelets linear, flat, of a shining brown or rarely pale and greenish, usually 2 to 4 lines long and scarcely 1 line broad, with 10 to 20 flowers, the rhachis bordered by hyaline wings often deciduous, the spikelets sometimes lengthening to ½ in. with about 30 flowers and then when old appearing stipitate, the nuts with the glumes and wings of the rhachis having fallen away. Glumes closely imbricate, broad, the keel prominent and produced into a very short point with 2 or 3 obscure nerves on each side, the nerveless margins broad and rounded. Style 3-cleft. Nut prominently 3-angled, less than half the length of the glume.—Bœckel. in Linnæa, xxxvi. 319; F. Muell. Fragm. viii. 263; *C. venustus*, R. Br. Prod. 217.

N. Australia. North coast, *R. Brown* (with very narrow spikelets); Albert River, *Henne;* Flinders River, *F. Mueller.*

Queensland. Keppel Bay, *R. Brown;* Port Denison, *Fitzalan* (with long narrow spikelets); Rockingham Bay, *Dallachy;* Rockhampton and numerous localities in south Queensland, *Bowen, O'Shanesy, Thozet, Mitchell* and others.

N. S. Wales. New England, *C. Stuart;* Richmond River, *Woolls;* Clarence River, *Beckler, Wilcox;* Darling River, *Victorian Expedition.*

Victoria. Broken and Murray Rivers, *F. Mueller.*

The species extends over East India and the Malayan Archipelago.

55. **C. hæmatodes**, *Endl. Prod. Fl. Norf.* 22.—Stems stout, acutely 3-angled, attaining 4 or 5 ft. Leaves long and broad, the largest said to be as long as the stem and 1 to 1½ in. broad. Spikelets in densely crowded spikes in a large compound umbel of many rays, the longer ones attaining 6 to 8 in. or even more. Involucral bracts 6 to 8 or even more, the outer ones sometimes 2 to 3 ft. long and 8 in. broad. Spikelets spreading, linear-terete or scarcely flattened, acute, brown or pale-coloured, 6 to 8 lines or according to Endlicher sometimes 1 in. long, 10- to 16-flowered, the rhachis bordered by hyaline wings. Glumes imbricate, rather narrow and acute, erect and appressed, scarcely keeled, but striate with 7 or 9 prominent nerves, about 3 of the outer ones short and empty. Style 3-cleft. Nut oblong, triquetrous, more than half the length of the glume.—*C. congestus*, forma *gigantea*, F. Muell. Fragm. viii. 269.

N. S. Wales. Lord Howe's Island, *Milne, Fullagar.* Also in Norfolk Island. The Lord Howe's Island specimens are referred by F. Mueller to the *C. congestus*, but appear to me to differ from that species in habit and inflorescence as well as in the form of the spikelets.

56. **C. auricomus**, *Sieb. in Spreng. Syst.* i. 230.—Rhizome short and thick. Stems stout, triquetrous, 1 to 3 ft. high, the angles acute and sometimes almost winged under the inflorescence. Leaves rather broad, often as long as or longer than the stem, with long broad sheaths and ending in long narrow points. Spikelets in elongated spikes in a compound umbel of many rays, the longer ones often 3 in. long. Involucral bracts several, 2 of them much longer than the inflorescence. Spikelets spreading, linear-terete or scarcely flattened, pale-coloured, usually 3 to 6 lines long but sometimes twice as long, ½ to ¾ line broad, 12- to 20-flowered, the rhachis bordered by hyaline wings. Glumes imbricate, narrow, shortly pointed, the keel prominent and obscurely 3-nerved, the nerveless sides pale brown or almost hyaline. Style 3-cleft. Nut oblong, obtuse, triquetrous, much shorter than the glume. —F. Muell. Fragm. viii. 263; *C. venustus*, Kunth, Enum. ii. 68, Bœckel. in Linnæa, xxxvi. 316, not of R. Br.

Queensland. Rockingham Bay, *Dallachy*; Port Curtis, *M'Gillivray*: King's Creek, *Bowman.*

Abundant in tropical Asia, extending to the South Pacific Islands and into tropical Africa, and very closely allied to but scarcely identical with the tropical American *C. giganteus.* It is also the n. 111 of Sieber's Agrostotheca, but his specimens are West Indian.

SECTION 5. DICLIDIUM, Nees.—Spikelets very narrow, terete or nearly so, either several-flowered with narrow concave closely appressed distant glumes, the rhachis flexuose and bordered by hyaline wings embracing the nut, or reduced to a single perfect flower, the winged rhachis however continued within the flowering glume and often protruding beyond it, with or without a terminal imperfect glume or rudimentary flower. Style 3-cleft. Nut equally 3-sided. After flowering the rhachis is often articulate at or near the base, the 2 small lower empty glumes either falling off with the spikelet or one or both remaining persistent.

57. **C. ferax**, *Rich.*; *Kunth, Enum.* ii. 89.—Stems usually stout, 1 to 3 ft. high, acutely or obtusely 3-angled. Leaves shorter or rarely as long as the stem. Spikelets numerous, in elongated spikes in a large compound umbel of numerous rays, the longest often 6 to 8 in. long. Involucral bracts several, long and sometimes broad. Spikelets linear-terete, very spreading, 5 to 10 lines long, mostly 6- to 10-flowered, the rhachis flexuose, bordered by hyaline wings and at length articulate below the lowest flowering glume and sometimes between each glume. Glumes distant, but closely appressed to the rhachis, narrow, obtuse or almost acute, concave, scarcely keeled, 7- or 9-nerved. Style 3-cleft. Nut obovoid-oblong, obtusely triquetrous, half as long as the glume and closely embraced within it by the wings of the rhachis.—Bœckel. in Linnæa, xxxvi. 399; *C. pennatus*, Bœckel. l. c. 404, not of Lam.

Queensland. Port Curtis, *M'Gillivray*; Mount Elliot and Daintree River, *Fitzalan*; Gracemere, *O'Shanesy.*

Widely spread over the tropical regions of the New and the Old World. I am unable to distinguish the two supposed species described by Bœckeler, and they should probably include several others. It was on the authority of a specimen named by Jussien that he referred this species to the *C. pennatus*, Lam.; the original description however in the Encyclopædia is at complete variance and evidently relates to the above described *C. canescens*, Vahl, or *C. ventricosus*, Br. as correctly determined by Kunth and others.

C. lucidus, Nees; Kunth, Enum. ii. 89, but not of R. Br. was founded on Sieber's specimens, Agrostotheca, n. 110, supposed to be Australian and which Bœckeler, Linnæa, xxxvi. 364, refers to his *C. nitidulus*. These specimens however are West Indian, and appear to me to be the *C. ferax* with the spikelets in flower not yet fully developed.

58. **C. Bowmanni**, *F. Muell. Herb.*—Stems tufted, very slender, 1 to 1½ ft. high. Leaves much shorter, very narrow. Spikelets in short close spikes in an umbel of few slender rays, the longest about 2 in. long, the whole inflorescence sometimes reduced to the central sessile spike. Involucral bracts few, very narrow, 1 or 2 rather longer than the inflorescence. Spikelets rather numerous, linear-terete almost subulate, flexuose, 6 to 9 lines long and ending in a fine point, 6- to 10-flowered, the rhachis bordered by hyaline wings. Glumes distant, closely appressed to the rhachis, obtuse or scarcely acute, with a green rather broad keel, the sides brown and finely several-nerved. Style 3-cleft. Nut narrow, triquetrous, more than half as long as the glume, closely embraced within it by the wings of the rhachis.

Queensland. Brisbane River, Moreton Bay, *Bailey, Leichhardt* (the latter with rather broader leaves); Herbert's Creek, *Bowman*; Gracemere, *O'Shanesy*.

59. **C. trichostachys**, *Benth.*—Stems stout, about 2 ft. high, prominently 3-angled but quite smooth. Leaves mostly longer and rather broad. Spikelets in loose spikes of ½ to ¾ in. in a large umbel of numerous rays, the longer ones often 4 to 5 in. long. Involucre of several long bracts, the outer ones often 3 lines broad. Spikelets linear-filiform, spreading, 2 to 3 or rarely 4 lines long, usually 3- or 4-flowered, the rhachis flexuose and bordered by hyaline wings. Glumes distant, closely appressed to the rhachis, very narrow, acute. Style 3-cleft. Nut much shorter than the glume, very narrow, closely embraced by the wings of the rhachis.

Queensland. Rockingham Bay, *Dallachy*.

60. **C. leiocaulon**, *Benth.*—Stems rather slender, usually about 1 ft. high, obtusely triquetrous, quite smooth. Leaves much shorter, narrow. Spikelets in ovoid-globular rather dense spikes or rather looser and nearly ½ in. long, in a simple umbel of about 4 to 6 rays, the longest 1 to 2 in. long. Involucre of few bracts not much longer than the inflorescence. Spikelets linear-terete, at length flexuose and 3 or sometimes 4 lines long, with about 3 flowers, the rhachis bordered by hyaline wings. Flowering-glumes narrow, distant, closely appressed to the rhachis, striate with several nerves, the terminal one often empty or with an imperfect flower. Style 3-cleft. Nut narrow, closely embraced by

the wings of the rhachis. The spikelet falling away usually carrying off the second empty glume.—*Mariscus lævis*, R. Br. Prod. 218.

Queensland. Cape York, *Daemel;* Rockhampton, *O'Shanesy.*
N. S. Wales. Port Jackson, *R. Brown:* Richmond, *Woolls.*

Very nearly allied to the following and possibly a variety only. Some specimens from Endeavour River, *Banks and Solander*, appear almost intermediate between the two.

61. **C. scaber,** *Benth.*—Stems 1 to 2 ft. high or rather more, triquetrous and usually very scabrous on the angles. Leaves usually shorter but sometimes longer than the stem. Spikelets in ovoid or shortly cylindrical spikes, in a compound umbel with numerous rays, the longest 2 to 6 in. long, the branches or partial rays divaricate. Involucral bracts several, often very long, the outer ones 2 to 3 lines broad. Spikelets slender, terete and often curved, either 1-flowered and about 2 lines long or flexuose with a second flower or empty glume at the end of the lower one, the rhachis within the glume bordered by hyaline wings, two outer empty glumes much narrower than in *C. umbellatus*, flowering glume or glumes narrow, striate, closely appressed to the rhachis. Style 3-cleft. Nut narrow, triquetrous, closely embraced by the wings of the rhachis —*Mariscus scaber*, R. Br. Prod. 218.

N. Australia. Gulf of Carpentaria, *R. Brown.*
Queensland. Rockingham Bay, *Dallachy;* Percy Island, *Walter.*

This and the preceding species, although formerly placed in *Mariscus*, have all the characters of *Diclidium*, with the second and third flowering glumes always distant, not overlapped by the lower one as in the section *Mariscus.*

SECTION 6. MARISCUS.—Spikelets small, terete or scarcely flattened, containing 1 or 2 perfect flowers, the very short rhachis bordered by hyaline wings and usually articulate near the base, the spikelet on falling off usually leaving a disk-like scar. Glumes imbricate, the lowest empty glume often remaining persistent, the second often falling off with the spikelet, the third or flowering glume wholly enclosing the continuation of the rhachis, or partially embracing the second flowering glume. Style 3-cleft. Nut triquetrous.

Although this section in some measure connects *Cyperus* with *Kyllinga*, it appears sufficiently distinct from the latter in habit, in the production of the winged rhachis above the single flower or between the two flowers of the spikelet and in the trimerous styles and fruit, and although the style is dimerous in the first two sections of *Cyperus*, it is then accompanied by other characters quite at variance with those of *Kyllinga.* Like the section *Diclidium*, it is a near approach in technical character to *Schœnus* though very different in habit.

62. **C. decompositus,** *F. Muell. Fragm.* viii. 267.—Stems prominently 3-angled, several ft. high. Leaves very long, 3 to 4 lines broad. Spikelets in very numerous small globular clusters in a very compound umbel of numerous rays, the longest 4 to 6 in. long. Bracts of the general involucre like the leaves, often 2 ft. long or more and 3 to 4 lines broad with scabrous edges, those of the secondary and ter-

tiary umbels small and setaceous. Spikelets not above 1½ line long, narrow-ovoid, usually with 2 perfect flowers, the short rhachis bordered by broad hyaline wings. Glumes usually 5, imbricate, broad and striate, the two lower and the terminal one empty. Style 3-cleft. Nut ovoid, triquetrous, more than half the length of the glume.—*Mariscus decompositus*, R. Br. Prod. 218.

N. Australia. Gulf of Carpentaria, *R. Brown.*

Queensland. Endeavour Rivers, *Banks and Solander*, *A. Cunningham*; Rockingham Bay, *Dallachy.*

63. **C. Armstrongii**, *Benth.*—Stems from a thick tufted base varying from under 1 ft. to near 2 ft. high, stout and triquetrous. Leaves rather broad and sometimes very long. Spikelets in cylindrical spikes in a more or less compound umbel of numerous but not long rays. Involucral bracts long, rather rigid, sometimes 2 to 3 lines broad. Spikelets very numerous but not closely packed, spreading, narrow oblong, scarcely more than 1 line long, mostly with 1 perfect flower. Glumes imbricate, 4 or 5, the lowest small empty and persistent, the second empty but half as long as the flowering one and falling off with it, the third or flowering glume rather acute, finely striate, enclosing the short winged rhachis, the fourth glume shortly protruding, usually enclosing a male flower and sometimes a second male flower and glume above it. Style 3-cleft. Nut ovoid-oblong, triquetrous, nearly as long as the glume.

N. Australia. Port Essington, *Armstrong*; Part Darwin, *Schultz*, *n.* 731.

Queensland. Percy Islands, *A. Cunningham*; Rockingham Bay, *Dallachy.*

Very nearly allied to *C. Seemannianus*, Bœckel. from the Fiji Islands, but more rigid, the inflorescence much more compound and the spikelets smaller.

64. **C. umbellatus**, *Benth. Fl. Hongk.* 386.—Stems from under 1 ft. to nearly 2 ft. high, triquetrous, smooth. Leaves variable, narrow or rather broad, shorter or longer than the stem. Spikelets very numerous, in close cylindrical spikes of ½ to 1 in. all sessile or mostly pedunculate in a simple umbel or very rarely 1 or 2 of them branched at the base. Involucral bracts usually several, much longer than the inflorescence, the outer ones sometimes 2 or 3 lines broad. Spikelets spreading, linear-terete, 1½ to 2 lines long, almost always 1-flowered. Two outer glumes short and empty, both usually attached below the articulation; flowering glume occupying the whole spikelet, enclosing the flower and a continuation of the rhachis which with its wings assumes the appearance of an empty scarious glume. Style 3-cleft. Nut narrow, triquetrous, nearly as long as the glume and enclosed in it. —F. Muell. Fragm. viii. 267; *Mariscus umbellatus*, Vahl; Kunth, Enum. ii. 118; *Kyllinga umbellata*, Rottb. Descr. et Ic. Pl. 15, t. 4, f. 2; Beauv. Fl. Ow. et Ben. t. 55; *Kyllinga panicea*, Rottb. l. c. t. 4, f. 1.

Queensland. Condamine River, *Leichhardt*, and various localities in South Queensland, *Bowman*, and others; Brisbane River, *F. Mueller*, *Bailey.*

Var. *laxiflora.* Spikes longer and not so dense, 1 or 2 of the outer ones with a short branch at the base.—Herbert Creek, *Bowman.*

The species is widely distributed over tropical Asia and Africa, and may be the same as one of the South African ones. Bœckeler, Linnæa, xxxvi. 377, refers the *Mariscus umbellatus* of Vahl to the N. American *C. ovularis*, Torr., which appears to me to be quite different. Vahl's *M. paniceus* and *M. umbellatus* were founded on Rottboell's Indian *Kyllinga panicea* and *K. umbellata*, the latter proving to be a larger variety of the former.

65. **C. conicus,** *Bœckel. in Linnæa*, xxxviii. 371.—Stems 1 to 1¼ ft. high, rather rigid, often much thickened at the base. Leaves often as long, rather rigid, ending in long subulate points, the margins scabrous and sometimes almost spinulose-denticulate. Spikelets very numerous, usually in dense sessile ovoid or conical heads, often 3-lobed at the base, 4 to 6 lines long and often as broad, in a simple umbel of 6 to 10 rays, the longest 1¼ to 2 in. long. Involucral bracts 3 to 5, long and tapering into long subulate points. Spikelets narrow-oblong, nearly 1½ lines long, with 1 perfect flower. Glumes imbricate, the lowest empty glume small, very broad and cupshaped, scarious, remaining usually with the subtending small glume-like bract persistent after the spikelet has fallen off, the second empty glume ovate obtuse striate more than half the length of the spikelet; flowering glume almost acute, striate, closely enveloping the broadly winged rhachis and the base of a fourth glume which is empty or contains a male flower. Style 3-cleft. Nut ovoid, triquetrous, nearly as long as the glume.—F. Muell. Fragm. viii. 268; *Mariscus conicus*, R. Br. Prod. 218.

N. Australia. Gulf of Carpentaria, *R. Brown*; Port Darwin, *Schultz*, *n.* 603, 709.

Queensland. Port Curtis, *M'Gillivray*; Bokhara Creek, *Leichhardt*; Bowen Downs, *Birch*.

W. Australia. Murchison River, *Oldfield*.

Var. *ramosus*. Heads of spikelets branching into dense pyramidal panicles. Leaves numerous, broad at the base.—Sweers Island, *Henne*; Port Denison, *Fitzalan*.

C. glaucinus, Bœckel. in Flora, 1875, 89, from Port Mackay, *Amalia Dietrich*, from the character given does not appear to differ from *C. conicus*.

C. tetracarpus, Bœckel. l. c. 88, also from Port Mackay, *Amalia Dietrich*, must be very near the same species in many respects, but the spikelets are said to contain 4 or 5 flowers, which would remove it from the section *Mariscus*, where it is placed by Bœckeler next to *C. glaucinus*.

3. HELEOCHARIS (Eleocharis), R. Br.

(Scirpidium *and* Heleogenus (Eleogenus) *Nees.*)

Spikelet solitary, terminal, with many hermaphrodite flowers. Glumes imbricate all round the rhachis, the lowest 1 or 2 empty. Hypogynous bristles about 3 to 8, usually scabrous or ciliate with reflexed hairs, rarely deficient. Stamens 3, 2 or 1. Style dilated at the base, divided to above or below the middle into 2 or 3 filiform stigmatic branches. Nut obovoid or nearly globular and 3-ribbed, or more or less flattened and biconvex with 2 marginal ribs, always crowned by the conical or depressed persistent base of the style, the remainder of the style falling away.—Stems simple, tufted, without perfect leaves, the barren stems often taken for leaves, the real leaves reduced to sheathing scales, of which the lowest are short brown and loose, the innermost (sometimes the only one) forming a long sheath closely appressed nearly or quite to its orifice. No involucre except the outer empty glume, which takes the place of a bract subtending the spikelet and is sometimes larger than the other glumes, very rarely produced into a short point.

Generally distributed over the tropical and temperate regions of the New as well as the Old World, two species extending to within the Arctic circle. Of the thirteen Australian ones three only are endemic, and one of these is scarcely more than a variety of a common one, three others are also in New Zealand and in some temperate regions in the northern or southern hemisphere, one has hitherto been only identified out of Australia in East India, the remaining six are common tropical or temperate species in the Old World and all, or all but one, are also in America.

SECT. I. **Limnocharis.** *Spikelets cylindrical. Glumes obtuse, not at all or very obscurely keeled, rather rigid, with a hyaline border. Persistent base of the style forming a conical usually flat beak to the nut.*

Stems terete, appearing articulate from the transverse septa dividing the internal pith . . . . 1. *H. sphacelata.*
Stems continuous, obtusely triquetrous or terete.
Glumes almost white, scarcely striate, the hyaline border very narrow and soon disappearing, the spiral arrangement very prominent. . . . . . 2. *H. spiralis.*
Glumes pale or dark, distinctly striate, the spiral arrangement not prominent . . . . 3. *H. variegata.*
Stems continuous, acutely 3- or 4-angled . . . . . . 4. *H. fistulosa.*

SECT. II. **Scirpidium.** *Spikelet cylindrical or tapering upwards, usually smaller than in* Limnochloa. *Glumes with a distinct green centre or prominent keel. Persistent base of the style shortly conical.*

Stem slender, acutely 4-angled . . . . 5. *H. tetraquetra.*
Stem obtusely angled, or terete and striate.
Inner leaf-sheath truncate at the orifice with a small erect point. Nut biconvex.
Spikelet pale-coloured, obtuse . . . . 6. *H. cylindrostachys.*
Spikelet usually dark coloured and rather acute . . 7. *H. acuta.*
Inner leaf-sheath oblique at the orifice without the dorsal point.
Spikelet 6 to 8 lines long. No hypogynous bristles. Nut biconvex . . . . 8. *H. atricha.*
Spikelets 3 to 5 lines long. Hypogynous bristles usually longer than the nut. Nut 3-ribbed . . 9. *H. multicaulis.*

SECT. III. **Heleogenus.** *Spikelet ovoid-conical or small and few-flowered. Glumes keeled. Persistent base of the style short and depressed. Leaf-sheath oblique at the orifice, often scarious.*

Nut biconvex, very smooth. Glumes deciduous, usually numerous.
Spike dense, many-flowered, pale coloured. Stems mostly above 6 in. high. Glumes broad, with a green centre . . . . 10. *H. capitata.*
Spike loose, dark-coloured, the glumes not very numerous, prominently keeled. Stems under 3 in. 11. *H. atropurpurea.*
Nut 3-ribbed and usually striate. Glumes not numerous. Stems short, filiform.
Leaf-sheath appressed to the orifice, usually brown. Spikelet narrow . . . . 12. *H. acicularis.*

Leaf-sheath loose and scarious at the orifice. Spikelets rather broad . . . . 13. *H. pusilla.*

H. (*E.*) *chætaria*, Rœm. et Sch.; Kunth, Enum. ii. 140, an East Indian plant, is given by Bœckel. in Linnæa, xxxvi. 429, as also Australian on the authority of Sieber's specimens, Agrostotheca, n. 24, which Nees had named *E. recurvata*, given by Kunth as a synonym of *H.* (*E.*) *depauperata*, a West Indian and South American closely allied if not identical species. The only specimens I have seen have the spikelets too imperfect to determine to what species they belong, and their origin whether Australian or West Indian is very uncertain. If Australian they may prove to be the same as *H. pusilla*, Br. with which they agree as to the leaf-sheath.

SECTION I. LIMNOCHARIS, Nees.—Spikelet cylindrical, often large. Glumes obtuse, not at all or very obscurely keeled, rather rigid, with a hyaline border. Persistent base of the style forming a conical usually flattened beak to the nut.

1. **H.** (**E.**) **sphacelata**, R. Br. Prod. 224.—Rhizome creeping or stoloniferous. Stems from under 2 ft. to 4 or 5 ft. high, 2 to 5 lines diameter, terete but appearing articulate from internal transverse septa, the principal nodes ½ to 1 in. distant, but several minor ones often appearing between them. Spikelet cylindrical, 1 to 2½ in. long; 2 to 4 lines diameter. Glumes closely imbricate, broadly obovate, very obtuse, scarcely striate but sometimes faintly 1-nerved, bordered by a narrow scarious margin and immediately under it by a brown zone or dark line. Hypogynous bristles 6 to 9, usually longer than the nut. Style-branches 2 or 3. Nut rather broad, minutely pitted or granular but not distinctly striate, the flattened beak rather narrow, with a narrow ring round its base.—Kunth, Enum. ii. 154; Bœckel. in Linnæa, xxxvi. 475; Hook. f. Fl. Tasm. ii. 85; F. Muell. Fragm. viii. 239; *Scirpus sphacelatus*, Spreng. Syst. i. 204; *Heleocharis plantaginea*, F. Muell. Fragm. viii. 238, not of R. Br.

N. Australia. Gulf of Carpentaria, *R. Brown*; Arnhem Land, *F. Mueller.*

Queensland. Rockhampton (the tubers of the rhizome alimentary) *O'Shanesy*; Brisbane River, *Bailey.*

N. S. Wales. New England, *C. Stuart*; Clarence River, *Beckler*, *Wilcox*; Camden county, *Miss Atkinson.*

Victoria. Wendu Vale, *Robertson*; Emu Creek, *Whan*; Mittagong, *Travers.*

Tasmania. Derwent River, *R. Brown*; abundant in lagoons near Formosa and other localities, *Gunn* and others.

S. Australia, Barossa Range and Lake Torrens, *F. Mueller.*

The species is also in New Zealand and apparently in the Fiji Islands. It is very closely allied to the true *H.* (*E.*) *plantaginea*, Br., which ranges over the warmer regions of the New and the Old World, but has not the dark mark at the end of the glumes, and, in the specimens examined at least, the beak of its nut is much shorter. The *H.* (*E.*) *biseptata*, Steud. Syn. Glum. ii. 82 is probably the same as *H. sphacelata.*

2. **H.** (**E.**) **spiralis**, *R. Br.*; *Kunth, Enum.* ii. 155.—Stems almost terete or more or less triquetrous, continuous inside, 1½ to 3 ft. high. Spikelets cylindrical, ½ to 1 in. long, about 2 lines diameter, pale-coloured or almost white. Glumes broadly ovate in the Australian specimens, almost orbicular in the Indian ones, closely imbricate, with a spiral arrangement more evident than in any other species, very

faintly striate, very obtuse, with a narrow scarious margin which at length disappears. Hypogynous bristles about 6, glabrous or scarcely appearing scabrous under a $\frac{1}{2}$ in. lens. Style-branches 2 or 3. Nut obovate, compressed, biconvex, the beak or persistent base of the style shortly conical.—Bœckel. in Linnæa, xxxvi. 473; *Scirpus spiralis*, Rottb. Descr. et. Ic. Pl. 45, t. 15, f. 1.

Victoria? Tarampa Creek, *Herb. F. Mueller.*

The species is dispersed over the tropical regions of both the New and the Old World, but chiefly in tropical America.

3. **H.** (**E.**) **variegata**, *Kunth, Enum.* ii. 153.—Stems obtusely triquetrous or nearly terete, continuous inside, from under 1 ft. to nearly 2 ft. high, usually 1 to 2 lines but when luxuriant 3 lines diameter. Sheathing scale oblique and appressed at the orifice. Spikelets cylindrical, from $\frac{1}{2}$ in. long when in flower to nearly 1 in. when in fruit, $1\frac{1}{2}$ to $2\frac{1}{2}$ lines diameter. Glumes from very broadly ovate to obovate-oblong, very obtuse, not keeled, many-nerved, with a narrow scarious border, either wholly pale coloured or with a dark line within the border. Hypogynous bristles usually about 6, very unequal in length. Style-branches 2 or 3. Nut (not seen ripe in the Australian specimens) biconvex, broad, striate and slightly transversely rugose, the beak or persistent base of the style narrow-conical, flattened, with a broad annular base.—Bœckel. in Linnæa, xxxvi. 470; *Scirpus variegatus*, Poir. Dict. vi. 749; *H.* (*E.*) *Sieberi*, Kunth, l.c. *H.* (*E.*) *compacta*, R. Br. Prod. 224; F. Muell. Fragm. viii. 239; *Scirpus compactus*, Spreng. Syst. i. 202.

N. Australia. Arnhem N. Bay, *R. Brown;* Lower Victoria River, *F. Mueller.*
Queensland. Rockingham Bay, *Dallachy;* Narrau River, *Mitchell.*

The species is widely spread in tropical and subtropical regions in the Old World and is also in tropical America. The characteristic dark zone on the glumes is very conspicuous in Brown's specimens, less so in the others. Mitchell's specimens may be doubtful, they are in flower only, the glumes are pale with a scarious border and the dorsal vein more conspicuous than is usual in the species.

4. **H.** (**E.**) **fistulosa**, *Schult.; Kunth, Enum.* ii. 155.—Stems continuous inside, acutely and equally 3-angled or unequally 4-angled, 1 to 2 ft. high, $1\frac{1}{2}$ to 2 lines diameter. Spikelets cylindrical, often fully 1 inch long, $1\frac{1}{2}$ to 2 lines diameter. Glumes imbricate but not very dense, ovate, obtuse but often narrower than in *H. variegata*, obscurely keeled, striate, bordered by a narrow scarious margin sometimes almost obsolete. Hypogynous bristles about 6. Style-branches 2 or 3. Nut broad, biconvex, striate and pitted between the striæ, the beak or base of the style flat-conical, short, with a raised annular base.—Bœckel. in Linnæa, xxxvi. 472; F. Muell. Fragm. viii. 239.

Queensland. Rockhampton, *Bowman, O'Shanesy.*

Widely spread over the tropical regions both of the New and the Old World, and the N. American *H.* (*E*). *quadrangulata*, Br. is but very slightly different. The few Australian specimens have certainly four angles to the stem, but two of them appear (in the dried state) close together, passing into the ordinary 3-angled form.

SECTION II. SCIRPIDIUM. Spikelet cylindrical and obtuse or tapering upwards and acute, usually smaller than in *Limnochloa.* Glumes with a distinct green centre or prominent keel. Persistent base of the style forming a short conical often laterally flattened beak.

5. **H. (E.) tetraquetra,** *Nees: Kunth, Enum.* ii. 150.—Stems slender, acutely 4-angled, usually about 1 ft. high. Inner sheathing scale appressed and truncate at the orifice with a minute erect point on one side as in *H. acuta.* Spikelet oblong-lanceolate, 3 to 4 lines long, 1 to 1½ lines diameter. Glumes rather more obtuse than in *H. acuta,* with a green centre, brown sides, and narrow scarious margins. Hypogynous bristles about 6, as long as the nut. Style-branches 3. Nut obovoid, 3-ribbed, smooth, the conical beak or base of the style somewhat flattened.—Bœckel. in Linnæa, xxxvi. 447 ; F. Muell. Fragm. viii. 239.

N. S. Wales. Richmond River, *Miss Atkinson,* the specimens in young flower, the characters therefore chiefly taken from East Indian ones. The species has there a wide range. It is very near *H. acuta* but constantly known by the acutely angular stem.

6. **H. cylindrostachys,** *Bœckel. in Flora,* 1875, 108 (from the char. given).—Stems terete, rather stout, mostly above 1 ft. high when full grown. Inner sheathing scale closely appressed, truncate at the orifice with an erect point of ½ to 1½ lines as in *H. acuta.* Spikelet oblong-cylindrical, obtuse, 6 to 9 lines long when fully out, scarcely 2 lines diameter, very pale coloured. Glumes very numerous and closely imbricate, ovate-oblong, very obtuse, scarious with thin hyaline margins, the green central nerve more or less distinct, otherwise nerveless, scarcely coloured or faintly tinged with brown, very deciduous as in *H. capitata.* Hypogynous bristles 6 to 8, mostly longer than the nut. Style branches 3 or rarely 2. Nut broadly obovate, usually much flattened, the beak or base of the style broadly conical and flat.

Queensland. Wide and Moreton Bays, *Leichhardt ;* Rockhampton, *Thozet ;* Boyne River, *Hartmann ;* Castle Creek, *Bunce.*

N. S. Wales. Camden and Richmond, *Woolls ;* New England, *C. Stuart ;* Clarence River, *Wilcox.*

These specimens are referred by F. Mueller, Fragm. viii. 240, to *H.* (*E.*) *obtusa,* Schult. which Bœckeler is probably right in reducing to the common *H. ovata,* Br. Our species however appears to be constantly distinct in the long narrow pale spikelet with very deciduous glumes, which I do not find in any of our European Asiatic or American specimens of *H. ovata* or *obtusa.*

7. **H. (E.) acuta,** *R. Br. Prod.* 224.—Rhizome creeping. Stems rather slender, terete, from 6 or 8 in. to 1½ ft. high or rather more. Sheathing scale appressed and horizontally truncate at the orifice, the edge often dark coloured, with a small erect point or rudimentary lamina ½ to 1 line long, inserted usually on one side, immediately below the margin. Spikelet linear-oblong or lanceolate, rather acute, from under ½ in. to nearly 1 in. long. Glumes obtuse or almost acute, the

dorsal nerve or keel more or less prominent, the sides brown with pale more or less scarious margins. Hypogynous bristles 3 to 7, usually 5 or 6, longer or shorter than the nut. Style-branches usually 3. Nut obovoid or almost orbicular, very convex on both sides, but without the third angle of *H. multicaulis*.—*H.* (*E.*) *mucronulata*, Nees in Ann. Nat. Hist. ser. i. vi. 46; Bœckel. in Linnæa, xxxvi. 466; *H.* (*E.*) *gracilis*, Hook. f. Fl. Tasm. ii. 85, not of R. Br.; *H. palustris*, F. Muell. Fragm viii. 240, not of R. Br.; *Scirpus acutus* and *S. tener*, Spreng. Syst. i. 203, 204.

Queensland. Endeavour River, *Banks and Solander*; Plains of the Condamine, *Leichhardt*; Gracemere, *O'Shanesy*.

N. S. Wales. Port Jackson, *R. Brown*; New England, *C. Stuart*, *Perrott*; Richmond River, *Miss Hodgkinson*; between the Lachlan and Darling Rivers, *Victorian Expedition*.

Victoria, *Robertson*; Skipton, *Whan*; Wimmera, *Dallachy*.

Tasmania. Derwent River, *R. Brown*; abundant in marshy places throughout the island, *J. D. Hooker* and others.

S. Australia. Bethanie, *Behr*, *F. Mueller*; Angas River, *F. Mueller*.

W. Australia. Various stations from King George's Sound to Swan River, *Drummond*, *n.* 100, 364, *F. Mueller*, and others.

Var. *pallens*. Spikelet of a very pale brown, the glumes almost scarious, but the shape of the spikelet, the number and shape of the glumes and other characters, those of *H. acuta* not of *H. cylindrostachys*.—Upper Victoria River, *F. Mueller*; Bowen Downs, *Birch*; beyond the Darling and near Mount Murchison, *Victorian Expedition*. To this variety may probably belong the *H. Dietrichiana*, Bœckel. in Flora, 1876, 107, from Rockhampton, *Amalia Dietrich*.

The typical form of *H. acuta* occurs in New Zealand, and some specimens from Chile and other parts of extratropical South America appear to be the same species. I have not as yet been able to ascertain whether they have been as yet published under any or what name.

8. **H.** (**E.**) **atricha**, *R. Br. Prod.* 225.—Stems slender, tufted, striate, under 1 ft. high. Sheathing scale long, rather loose, oblique at the orifice as in *H. multicaulis*, but the habit of the plant rather of *H. acuta*. Spikelet linear, cylindrical, ½ to ¾ in. long. Glumes obtuse, the dorsal midrib scarcely prominent, the margins with a very narrow scarious border and just within it a brown line. No hypogynous bristles. Style-branches 2. Nut much flattened, but convex on both sides, broadly obovate, elegantly pitted in numerous vertical rows, the base of the style surrounded by a very prominent border.—F. Muell. Fragm. viii. 252.

N. Australia. Between Norman and Gilbert Rivers, *Gulliver*.

N. S. Wales. Port Jackson, *R. Brown*; New England, *C. Stuart*.

9. **H.** (**E.**) **multicaulis,** *Sm. Engl. Fl.* ii. 64.—Stems from a creeping rhizome usually more slender or weaker than in *H. acuta*, rarely above 1 ft. long, and often much shorter. Inner leaf-sheath appressed, but the orifice slightly dilated, oblique and sometimes almost lanceolate, obtuse or acute without any distinct point. Spikelet oblong or almost ovate-oblong, 3 to 4 or rarely 5 lines long, 1 to 1½ lines broad. Glumes oblong, 1½ to 2 lines long, obtuse or the upper ones acute, the

keel usually green, the sides brown, scarious, hyaline towards the edge. Hypogynous bristles 6 or fewer, usually longer than the nut. Style-branches 3. Nut obovoid-triquetrous, the dorsal rib as prominent as the lateral ones.—Kunth, Enum. ii. 149; Reichb. Ic. Fl. Germ. t. 296; Bœckel. in Linnæa, xxxvi. 457; *H.* (*E.*) *gracilis*, R. Br. Prod. 224; *H. gracillima*, Hook. f. Handb. N. Zeal. Fl. 745.

N. S. Wales. Port Jackson, *R. Brown*, *C. Moore*, *Woolls.*
Victoria. Goulburn River, *F. Mueller.*
S. Australia. Lofty Range, *F. Mueller.*
W. Australia. *Drummond*, *n.* 137, appears to be a dwarf state of this plant, but the specimens are not in a state for absolute determination.

If I am correct in the identification of this species it is also in north-western Europe and in New Zealand. Can it have been introduced from Europe? Sieber's specimens, Agrostotheca, n. 115, named by Nees as *E. gracilis*, referred by Kunth to *H.* (*E.*) *maculosa*, and published by Bœckeler as a distinct Australian species under the name of *H. gracillima*, are West Indian.

SECTION 3, HELEOGENUS. Spikelet ovoid-conical or small and few-flowered. Glumes with a prominent or greenish keel. Persistent base of the style short and depressed. Inner leaf-sheath oblique at the orifice, often scarious.

10. **H. (E.) capitata,** *R. Br. Prod.* 225.—Stems usually densely tufted, from under 6 in. to nearly 1 ft. high, slender, striate. Inner leaf-sheath short, appressed or rather loose, oblique at the orifice. Spikelet ovoid-conical or nearly globose, pale-coloured, rarely above 2 lines diameter. Glumes numerous, all including the 1 or 2 outer empty ones very deciduous, ovate, obtuse, more or less scarious, with a broad more opaque or greenish centre or dorsal nerve scarcely forming a prominent keel. Style-branches 2 or rarely 3. Hypogynous bristles 5 to 8, longer or shorter than the nut. Nut obovoid, biconvex or the inner face nearly flat, shining, crowned by the very small persistent depressed base of the style.—Kunth, Enum. ii. 150; Bœckel. in Linnæa, xxxvi. 461; F. Muell. Fragm. viii. 240.

N. Australia. Gulf of Carpentaria, *R. Brown*; Sea range and Victoria River, *F. Mueller.*
Queensland. Endeavour River, *Banks and Solander.*
W. Australia. Murchison River, *Oldfield.*

The species is widely spread over the warmer regions of the New and the Old World.

H. (*E.*) *setacea*, R. Br. l. c. (*Scirpus Brownei*, Spreng. Syst. i. 204) from Endeavour River, *Banks and Solander* does not appear to me to differ from slender specimens of *H. capitata.*

11. **H. (E.) atropurpurea,** *Kunth, Enum.* ii. 151.—Stems densely tufted, slender often filiform, 1 to 3 in. high. Inner leaf-sheath appressed, the orifice oblique, acuminate or lanceolate, in some specimens scarious and at length lacerated, in others green. Spikelet ovate, slightly compressed, attaining about 2 lines in length and 1½ lines broad at the base, or in the smaller forms, 1 line long and ¾ line broad.

Glumes loosely imbricate or almost spreading, not numerous, deciduous, acute, the keel prominent and green, the sides dark brown and nerveless. Stamens 1 or 2. Style-branches 2. Hypogynous bristles usually 4 sometimes 5 to 8 in the typical form, and as long as the nut, very short or entirely wanting in some varieties. Nut small, obovate, biconvex, smooth and shining, at length dark brown or black, crowned by the small depressed persistent base of the style.—Bœckel. in Linnæa, xxxvi. 458; F. Muell. Fragm. viii. 240.

N. Australia. Victoria River, *F. Mueller.*
Queensland. Brisbane River, *Bailey.*
N. S. Wales. Richmond River, *C. Moore.*

Var. *setiformis.* Stems filiform, under 2 in. high. Bristles very short or none.—Carron's Creek, Carpentaria, *Gulliver ;* Rockhampton, *O'Shanesy.*

The species is spread over the tropical and temperate regions of the Old World, and is, perhaps, in America also.

12. **H. (E.) acicularis,** *R. Br; Kunth, Enum.* ii. 141.—Stems tufted, rarely slightly stoloniferous, filiform, 1 to 3 in. high in the typical form. Inner leaf-sheath appressed to the orifice, which is oblique obtuse and very thin though green and not scarious. Spikelet lanceolate, acute, 1 to 2 lines long, dark brown. Glumes few, ovate, obtuse or almost acute, the keel scarcely prominent usually pale, the sides brown, nerveless, with narrow scarious margins. Stamens 3. Style-branches 3. Hypogynous bristles few. Nut small, obovoid, not compressed, 3-ribbed, slightly striate and transversely rugulose, crowned by the small depressed base of the style.—Bœckel. in Linnæa, xxxvi. 481.

Victoria. Edward's River, *F. Mueller.* The specimens not yet in fruit, but apparently referrible to the true *H. acicularis*, which is common in tropical and temperate regions, in the New as well as the Old World.

Var. *elongata.* Stems 8 to 10 in. long, but filiform with the brown appressed sheaths of the European plant.

13. **H. (E.) pusilla,** *R. Br. Prod.* 225.—Very near *H. acicularis* and, perhaps, a variety as suggested by F. Mueller. Stems in tufts but on a slender creeping rhizome, 1 to 3 in. high, filiform. Inner leaf-sheath appressed except at the orifice which is loose scarious and oblique. Spikelet oblong-lanceolate, brown, few-flowered, 1 to 2 lines long. Glumes few, obtuse, with a broad pale dorsal keel, the sides of a rich brown, the margins scarious. Hypogynous bristles very small or none. Stamens usually 3. Style-branches 3. Nut obovoid, striate, transversely pitted, with 3 prominent ribs.—*H. acicularis,* var. F. Muell. Fragm. viii. 240; *E. recurvata,* Nees, in Sieb. Agrostoth. n. 24?; *Scirpus pumilio,* Spreng. Syst. i. 204.

N. S. Wales. Port Jackson, *R. Brown.*
Victoria. Bacchus Marsh and Mount Emu Creek, *F. Mueller.*
Tasmania. South Esk River, *C. Stuart.*

4. FIMBRISTYLIS, Vahl.

(Trichelostylis and Oncostylis, *Nees.*)

Spikelets solitary capitate or irregularly umbellate, with several usually many flowers, all hermaphrodite or rarely the upper ones female only. Glumes imbricate all round the rhachis or rarely distichous, the lowest 1 or 2 rarely 3 or 4 empty. No hypogynous bristles. Stamens 3, 2 or 1. Style flattened and ciliate or slender, with a conical or bulbous-shaped base, articulate on the ovary and falling off with the style, or (in *Oncostylis*) remaining persistent on the ovary long after the style has fallen away; stigmatic branches 2 or 3, filiform. Nut obovoid globular or more or less flattened and biconvex, often much contracted at the base.—Tufted annuals or perennials, never so large as the larger *Scirpi*. Leaves narrow, radical or at the base of the stem, sometimes reduced to membranous or rather rigid sheathing scales. Inflorescence terminal. Involucral bracts under the principal rays usually short, rarely 2 or 3 exceeding the inflorescence. Spikelets solitary on the stem or on the rays or rarely clustered, pale or dark brown or almost white, never black.

The genus extends all round the world, but chiefly in tropical or subtropical regions, and a larger proportion is Australian than in the case of *Scirpus* and *Heleocharis*. Of the fifty-six Australian species, thirty-nine are either really endemic or have not yet been identified with extra-Australian ones, three or four of them being however very closely allied to corresponding Asiatic species, sixteen are tropical Asiatic species, the majority of which extend into Africa, and seven of them are also in America, the remaining one species is also in New Zealand, and, perhaps, also in South Africa. Some three or four of the endemic species are as yet known by so few specimens that they may require further confirmation.

Sect. I. **Heleocharoides.**—*Spikelet solitary, terminal. Glumes imbricate all round.*

Nut biconvex, with transverse raised lines or wrinkles.
Style-branches 2 or rarely 3.
Spikelet erect, usually whitish.
One or two lower glumes empty.
Stems leafless but often intermixed with a very few leaves. Style-branches 2.
Stamen 1. Style glabrous . . . . 1. *F. acicularis.*
Stamens 3. Style ciliate . . . . 2. *F. acuminata.*
Leaves numerous, filiform. Style-branches 3 . . 3. *F. punctata.*
About 4 lower glumes empty, all broad and obtuse.
Stems leafless . . . . 4. *F. rhyticarya.*
Leaves filiform, not numerous . . . . 5. *F. leucostachya.*
Spikelet nodding, usually brown . . . . 6. *F. nutans.*
Nut 3-angled or biconvex, smooth striate granular or tuberculate. Style-branches 3 or sometimes 2.
Spikelet oblong, lanceolate. Style-branches 3.
Spikelet about ½ line broad. Leaves few or none.
No involucral bract. Nut tuberculate . . . 7. *F. pauciflora.*
Spikelet about 1½ lines broad. Leaves filiform.
No involucral bract. Nut minutely tuberculate. 8. *F. cardiocarpa.*
Spikelets about 1 line broad. Leaves setaceous.
Involucral bract often as long as the spikelet . 9. *F. leucocolea.*

Spikelet ovate or oblong. Style-branches 2.
Spikelet 1 to 1½ lines broad. Nut tuberculate.
Leaves numerous, filiform. Flowers all hermaphrodite . . . . 10. *F. polytrichoides.*
Stems leafless. Upper flowers female . . . . 11. *F. androgyna.*
Spikelet 2 lines broad. Nut (smooth ?) rather broad. Leaves few, narrow . . . . 12. *F. subbulbosa.*
Spikelet 2 lines broad. Nut narrow-oblong, striate and cancellate. Stems leafless . . . . 13. *F. tetragona.*
Spikelet ovate, erect. Style-branches 3. Nut tuberculate. Leaves numerous.
Nut broad, 3-furrowed, on a long stipes . . . . . 14. *F. trigastrocarya.*
Nut 3-ribbed, on a short stipes . . . . 15. *F. monandra.*
Spikelet globular, erect. Style-branches 3. Leaves numerous.
Spikelet white, 2 to 3 lines diameter. Nut flattened, often surrounded by a hyaline wing . . . . . . 16. *F. pterygosperma.*
Spikelet brown, 1 to 1½ lines diameter . . . . . 17. *F. sphærocephala.*
Spikelet nodding, brown, ovoid or cylindrical, 3 lines diameter. Leaves long and flat. . . . . 18. *F. xyridis.*

(See also 35, *F. spiralis* and 37, *F. leptoclada*, which have sometimes solitary spikelets.)

SECT. II. **Abildgaardia.**—*Spikelets solitary or few, flat with distichous glumes, or narrow and spiral in 2 or rarely 3 rows. Style-branches usually* 3.

Spikelets solitary, narrow, usually spiral. Glumes long, cartilaginous or scarious.
Glumes scarious, acuminate, with erect points . . . 19. *F. oxystachya.*
Glumes rigid, opaque, acute, closely appressed . . . 20. *F. macrantha.*
Glumes rigid with long recurved points . . . . . 21. *F. squarrulosa.*
Spikelets often several, very flat, regularly distichous or slightly spiral.
Leaves few, narrow-linear, rigid. Spikelets solitary or rarely 2 or 3, pale or nearly white . . . . . . 22. *F. monostachya.*
Stems tall, leafless. Spikelets 3 to 5, pale-coloured . 23. *F. Brownii.*
Leaves numerous, narrow-linear. Stems 3 to 4 in. Spikelets 4 to 6, rich brown . . . . 24. *F. Dallachyi.*

SECT. III. **Dichelostylis.**—*Spikelets several usually numerous. Glumes imbricate all round. Style-branches* 2. *Nut biconvex.*

Tufted annuals, leafy at the base. Stems under 1 ft.
Nut smooth or very minutely striate or cancellate.
Style-bulb ciliate at the base, the hairs spreading or reflexed over the nut . . . . 25. *F. velata.*
Style-bulb glabrous . . . . 26. *F. æstivalis.*
Nut with distinct longitudinal striæ or ribs and transversely cancellate.
Spikelets numerous, under 2 lines long . . . . . 27. *F. dichotoma.*
Spikelets about 5 or fewer, above 2 lines long . . . 28. *F. depauperata.*
Perennials, often above 1 ft. high.
Nut with distinct longitudinal striæ or ribs and transversely rugose. Style flat, ciliate. Leaves often numerous.
Spikelets pale coloured, about 4 lines long. Leaf-sheaths hairy . . . . 29. *F. spirostachya.*
Spikelets usually brown, about 3 lines. Leaves glabrous . . . . 30. *F. diphylla.*
Nut smooth or rugose.
Style distinctly ciliate.

Stems leafless or with few leaves. Spikelets ovate-lanceolate, 1½ to 2 lines broad. Nuts smooth 31. *F. ferruginea.*
Stems leafless. Spikelets ovate or at length oblong, 1 line broad. Nut usually rugose . . . . 32. *F. denudata.*
Style slender, nearly glabrous. Nut minute, smooth.
Stem leafless. Spikelets lanceolate or oblong, 4 to 6 lines long . . . . 33. *F. elata.*
Leaves filiform, often numerous. Spikelets ovate, 2 to 3 lines long . . . . 34. *F. cæspitosa.*

SECT. IV. **Trichelostylis.**—*Spikelets several, usually numerous (rarely solitary in* F. spiralis *and* F. leptoclada). *Glumes imbricate all round. Style-branches* 3 (*except rarely in some* Glomeratæ). *Nut various.*

SERIES I. **Oligostachyæ.**—*Spikelets few, not clustered, occasionally solitary, above* 2 *lines long.*

Small annuals. Leaves numerous.
Leaves setaceous. Spikelets narrow. Nuts tuberculate 35. *F. spiralis.*
Leaves linear. Spikelets ovate, aristate. Nuts granular 36. *F. subaristata.*
Stems long, leafless. Spikelets narrow. Nuts tuberculate.
Spikelets 1 or 2, erect . . . . 37. *F. leptoclada.*
Spikelets few on spreading umbel-rays . . . . . . 38. *F. debilis.*

SERIES II. **Polystachyæ.** *Spikelets usually numerous in more or less compound umbels, not clustered on the rays.*

Spikelets ovate, about 3 lines long or more.
Nuts obovoid-clavate, smooth. Leaves and involucral bracts long . . . . 39. *F. corynocarya.*
Nuts tuberculate. Leaves few. Involucral bracts short.
Style glabrous or nearly so. Nut narrow . . . . 40. *F. solidifolia.*
Style ciliate. Nut broad . . . . 41. *F. obtusangula.*
Spikelets rarely 2 lines long, globular ovate or lanceolate.
Spikelets globular, ¾ to 1¼ lines diameter. Stamen usually 1 . . . . 42. *F. miliacea.*
Spikelets globular, 1½ to 2 lines diameter. Stamens usually 3 . . . . 43. *F. rara.*
Spikelets ovate or lanceolate, very numerous, under 2 lines. Stamens 1 rarely 2 or 3
Spikelets narrow-lanceolate . . . . 44. *F. microcarya.*
Spikelets ovate or oblong . . . . 45. *F. quinquangularis.*
Spikelets narrow, acute, 2- to 4-flowered (flowers more than 6 in all the preceding species) . . . . . . 46. *F. cyperoides.*

SERIES III. **Glomeratæ.**—*Spikelets more or less clustered on the rays of the umbel, and always a central cluster of* 2 *or more in lieu of the single central sessile spikelet. Leaves usually numerous.*

Spikelets not above 2 lines long in clusters of 2 or 3, interspersed usually with a few solitary ones.
Leaves green, flaccid, flat. Spikelets rich brown, ovoid, about 2 lines long . . . . 47. *F. furva.*
Leaves subulate, rigid, shining. Spikelets brown, 1 to 1½ lines long . . . . 48. *F. cymosa.*
Spikelets in clusters of 3 to 10.
Leaves long, rather glaucous. Spikelets 1 to 1½ lines long . . . . 49. *F. multifolia.*
Leaves and inflorescence silky-hairy. Spikelets 2 lines long . . . . 50. *F. sericea.*
Spikelets few but clustered, 3 to 4 lines long. Style-branches 2 . . . . 51. *F. macrostachya.*

Spikelets clustered, umbellate, 4 to 5 lines long. Style branches 3 . . . . 52. *F. Neilsoni.*

Series IV. **Capitatæ.**—*Spikelets collected in a single terminal head.*

Glumes obtuse, membranous. Involucral bracts concealed under the head or rarely 1 prominent. Nut tuberculate . . . . 53. *F. capitata.*
Glumes mucronate. Involucral bracts spreading, 1 to 3 longer than the head. Nut smooth or nearly so . . 54. *F. Schultzii.*

Sect. V. **Oncostylis.**—*Style bulbs persistent after the style has fallen but articulate on the nut and often at length deciduous.*

Spikelets 6 to 10 in a terminal cluster. Leaf-sheaths ciliate at the orifice . . . . 55. *F. barbata.*
Spikelets in a slightly compound or simple umbel. Leaf-sheaths not ciliate . . . . 56. *F. capillaris.*

Section 1. Heleocharoides.—Spikelet solitary, terminal. Glumes imbricate all round the rhachis, the lowest empty glume or subtending bract like the others or rarely produced into a point or lamina as long as the spikelet. Style-bulb normal.

1. **F. acicularis**, *R. Br. Prod.* 226.—Stems tufted, filiform, 3 to 6 in. high, leafless except the sheathing scales, but occasionally intermixed with tufts of 2 or 3 filiform leaves. Spikelets solitary, white, erect, slightly compressed, 3 lines long or rather more, 1½ line broad. Glumes imbricate all round but not numerous, oblong, almost acute, cartilaginous, nerveless except the 1- or 3-nerved keel, the lowest 1 or 2 glumes empty and broader. Stamen 1. Style glabrous; branches 2. Nut white, slightly compressed, marked with transverse raised wrinkles. —*F. australica*, Bœckel. in Linnæa, xxxviii. 384.

N. Australia. Arnhem Land, *F. Mueller*; Port Darwin, *Schultz, n.* 79. **Queensland.** Endeavour River, *Banks and Solander*; Dunk Island, *M'Gillivray.*

F. decumbens, Bœckel. in Flora, 1875, 710, from Lake Elphinstone, *Amalia Dietrich*, is probably the same species.

2. **F. acuminata**, *Vahl; Kunth, Enum.* ii. 221, var. *setacea.*—Stems slender, densely tufted, 3 to 6 in. high, leafless except the sheathing scales at the base but frequently intermixed with tufts of 2 or 3 filiform leaves. Spikelet solitary, erect, narrow-oblong, 3 or sometimes 4 lines long, scarcely above 1 line broad in this variety. Glumes closely imbricate all round, lanceolate, acute, cartilaginous, the keel scarcely prominent but often 3-nerved, especially on the lower glumes, the lowest 1 or 2 glumes empty. Stamens 3. Style slightly flattened and ciliate; branches 2. Nut obovate, biconvex, marked with transverse raised wrinkles.—*F. acuminata, B. minor*, Bœckel. in Linnæa, xxxvii. 4; *F. setacea*, Benth. in Hook. Lond. Journ. ii. 239.

Queensland. Moreton Bay, *F. Mueller, Bailey*; Fitzroy River, *O'Shanesy*; Rockingham Bay, *Dallachy.*

The typical *F. acuminata* has larger broader spikelets, the glumes more prominently keeled. It is spread over East India, Ceylon, and the Malayan Archipelago, the Australian variety is at least in the Archipelago.

F. nuda, Bœckel. in Flora, 1875, 110, from Port Denison, *Amalia Dietrich*, with obtuse spikelets would seem to be nearer the typical form of *F. acuminata.*

3. **F. punctata,** *R. Br. Prod.* 226.—Apparently annual, tufted, the stems 6 to 9 in. high. Leaves much shorter, numerous, narrow-linear, almost setaceous with short open sheathing bases or the inner ones with short scarious sheaths. Spikelet solitary, erect, oblong, 4 to 5 lines long, 1½ to 2 lines diameter, pale coloured. Glumes closely imbricate all round, rather rigid, above 2 lines long, obtuse but the broad prominent keel produced into a short erect very obtuse point, the sides smooth and veinless, 1 or 2 outer ones empty with rather longer points. Stamens 2 or 3. Style flattened, ciliate in the upper part; branches 3, short. Nut broadly obovate, biconvex, whitish with a few raised transverse ridges or wrinkles and minutely pitted all over.

Queensland. East coast, *R. Brown.*

In the specimens examined there certainly were 3 style-branches as described by Brown, although the nut showed no trace of a third angle or rib.

4. **F. rhyticarya,** *F. Muell. Fragm.* i. 215.—Stems from 8 or 9 in. to above 1 ft. high, leafless except short rather loose sheathing scales at the base. Spikelet solitary, erect, oblong-lanceolate or almost ovate-lanceolate, not at all or scarcely flattened, 4 to 6 lines long and 2 to 2½ lines diameter at the base, pale-coloured or whitish. Glumes closely imbricate all round, cartilaginous, broad, obtuse or scarcely acute, often marked in the centre with 3 or 5 nerves but scarcely keeled and otherwise veinless, about 4 outer ones shorter and empty. Stamens 3. Style flattened, ciliate; branches 2. Nut obovate, but little compressed, marked with several raised transverse wrinkles.—*F. acuminata*, F. Muell. Fragm. viii. 274, not of Vahl.

W. Australia. Victoria River and near Providence Hill, *F. Mueller.*

Queensland. Burdekin River, *F. Mueller;* Rockingham Bay, *Dallachy.*

It is most probably this species that was referred to as *F. schœnoides*, Vahl, in Hook. f. Fl. Tasm. Præf. 48.

5. **F. leucostachya,** *Bœckel. in Linnæa*, xxxviii. 385.—Stems tufted, slender, filiform, often 1 ft. high, with 1 or 2 short filiform leaves and sometimes the lower leaf long, and a few barren stems of 4 to 6 in., leafy throughout. Spikelet broadly ovoid in some specimens about 3 to 4 lines long and 2 lines diameter, narrow oblong-lanceolate, 6 to 8 lines long and 1½ diameter in others. Glumes numerous, closely imbricate all round but very deciduous, white or tipped with brown, nerveless or showing a short central nerve at the tip, very broad and obtuse in the typical form, oblong and almost acute in the narrow form, about 4 outer ones shorter and empty. Stamens 3. Style flat, ciliate; branches 2. Nut slightly compressed, white, marked with transverse raised wrinkles and minutely pitted.

N. Australia. Port Darwin, *Schultz, n.* 320, the two forms sent together. In the typical one the spikelets assume almost the shape of those of *F. pterygosperma ;*

in the narrow-spiked form they resemble those of *F. punctata*, but have not the remarkably obtuse points to the glumes, and the style-branches appear to be always two only.

6. **F. nutans,** *Vahl; Kunth, Enum.* ii. 221.—Stems tufted, slender, mostly above 1 ft. high, leafless except short appressed sheathing scales at the base. Spikelet solitary, terminal without any prominent subtending bract, but always more or less nodding, ovoid or ovoid-lanceolate, brown, 3 to 4 lines long, 1½ to 2 lines broad. Glumes numerous, imbricate all round, thinly membranous almost hyaline, very broad and obtuse or the slightly prominent keel produced into a minute point, about 4 of the outer ones empty, the lowest often with a rather long point. Stamens 3. Style much dilated, ciliate; branches 2, one of them often bifid. Nut obovate, biconvex or nearly flat on the inner face, marked with transverse raised wrinkles and tubercles when fully ripe, or perhaps sometimes nearly smooth.—Bœckel. in Linnæa, xxxvii. 5; R. Br. Prod. 226; F. Muell. Fragm. viii. 274.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown.*
Queensland. Sandy Cape, *R. Brown; Brisbane River, F. Mueller; Bailey;* Dawson River, *F. Mueller.*
N. S. Wales. New England, *C. Stuart.*

Extends over East India and the Malayan Archipelago to South China.

7. **F. pauciflora,** *R. Br. Prod.* 225. —Stems densely tufted, filiform, 3 to 6 in. high or rarely more. Leaves few and filiform, or all reduced to sheathing scales with scarcely any lamina. Spikelets solitary, erect, very narrow-oblong, nearly white, about 2 lines long and 1½ line broad. Glumes few but imbricate all round and very deciduous, cartilaginous, acute, keeled, the sides veinless, the 2 outer ones empty and more acuminate with the keel more or less distinctly 3-nerved. Stamen usually 1. Style not at all or scarcely ciliate; branches 3, rarely 2. Nut obovoid-globular, 3-ribbed, tuberculate or almost muricate.—*F. filiformis*, Kunth, Enum. ii. 221; Bœckel. in Linnæa, xxxvii. 23; *F. pumila*, Benth. in Hook. Lond. Journ. ii. 239.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* near M'Adam Range, *F. Mueller;* Regent's and Hunter's Rivers, *A. Cunningham.*
Queensland. Rockingham Bay, *Dallachy.*

Also in the Malayan Archipelago and peninsula. The plant closely resembles the var. *setacea* of *F. acuminata*, but the spikelets are narrower and the style and nuts quite different. Brown describes the style as 2-branched, Kunth says it is 3-fid or rarely 2-fid; in the specimens I have examined I have found it 3-branched, but I believe all to belong to the same species.

8. **F. cardiocarpa,** *F. Muell. Fragm.* i. 194.—Stems tufted and slender but rigid, 1 ft. high or more. Leaves much shorter, subulate,

with scarious sheaths. Spikelet solitary, erect, oblong or ovate-lanceolate, 4 to 5 lines long, 1½ to 2 lines diameter. Glumes numerous, imbricate all round, thin, almost hyaline, minutely dotted with brown, 2 outer ones empty almost ovate, the keel produced into a long point, the flowering ones narrow, 2 to 3 lines long, obtuse or the keel very slightly produced, the sides nerveless. Style slender, glabrous below the branches; branches 2, ciliate. Nut small, obovoid almost turbinate, truncate, with 3 prominent ribs and minutely tuberculate.

N. Australia. Upper Victoria River, *F. Mueller.*

9. **F. leucocolea,** *Benth.*—Stems densely tufted, slender, 3 to 6 in. high, hirsute at the base. Leaves mostly shorter, numerous, filiform, the persistent sheathing bases white and hyaline. Spikelet solitary, erect, oblong-lanceolate, 3 to 4 lines long, 1 line or scarcely more in diameter, pale brown. Glumes imbricate all round, lanceolate, at least 2 lines long, thinly membranous, the keel prominent and in the lower glumes produced into a rigid point, that of the outermost empty glume or subtending bract often as long as or longer than the spikelet. Stamens 3. Style scarcely flattened, glabrous; branches 3. Nut oblong, triquetrous, not seen ripe.

N. Australia. Upper Victoria River, *F. Mueller.* This species resembles in many respects the single-spikelet specimens of *F. leptoclada,* but appears to me sufficiently distinct in its foliage as well as in the glumes.

10. **F. polytrichoides,** *R. Br. Prod.* 226.—Stems densely tufted, slender, usually glabrous and only 2 or 3 in. high, but sometimes above 6 in. Leaves much shorter, numerous, filiform. Spikelets solitary, erect (or rarely a second lateral erect pedunculate one ?), oblong, 2 to 3 lines long and scarcely above 1 line diameter, pale brown. Glumes numerous, imbricate all round, deciduous, oblong or ovate-oblong, obtuse, membranous almost hyaline, the midrib scarcely prominent except on the lower glumes where it is sometimes produced into a short point, 1 or rarely 2 outer empty glumes with longer points one sometimes as long as the spikelet. Stamens 1 or 2. Style scarcely flattened but hairy; branches 2. Nut obovate, biconvex, dark-coloured, tuberculate.—Kunth, Enum. ii. 221; *F. juncea,* Bœckel. in Linnæa, xxxvii, 4, partly, but probably not *Scirpus junceus,* Forst.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown.*
Queensland. Moreton Bay, *F. Mueller.*

Also in East India and the Malayan Archipelago. The Australian plant agrees very well with the Indian one, identified with it by Kunth and others, but not with Forster's species with which Bœckeler unites it, if I am right in referring to this true *F. juncea* a plant gathered by Hinds in the Marquesas Islands.

11. **F. androgyna,** *R. Br. Prod.* 226.—Stems densely tufted, slender, 6 to 10 in. high, leafless except the sheathing scales. Spikelet

solitary, erect, narrow-lanceolate, pale coloured, about 4 lines long and rather above 1 line diameter at the base. Glumes numerous, imbricate all round, oval-oblong, obtuse or nearly so, thinly membranous, the keel slender but prominent, the sides almost hyaline towards the margin, 2 or 3 of the lower ones empty. Stamens in all the lower flowers 2 or 3, in the upper ones deficient or here and there a short filament. Style slender, slightly ciliate; branches 2, very long in the upper female flowers. Nut obovate, biconvex, white, tuberculate.

N. Australia. North coast, probably Arnhem Land, *R. Brown.*

12. **F. subbulbosa,** *Benth.*—Stems from a thick horizontal rhizome numerous, thickened and bulb-like at the base, slender, often 1½ ft. long. Leaves few narrow and short or almost reduced to sheathing scales. Spikelet solitary, erect, ovoid or oblong, about 4 lines long and 2 lines broad when full grown, light brown. Glumes numerous, imbricate all round, broadly ovate, obtuse or the keel slightly prominent, thin almost membranous, 3 or 4 outer ones empty shorter and sometimes more pointed. Stamens 3. Style flat, ciliate; branches 2. Nut obovate or oblong, biconvex, smooth in the specimens seen but not yet fully ripe.

Queensland, *Armitage;* Rockingham Bay, *Dallachy.*

13. **F. tetragona,** *R. Br. Prod.* 226.—Stems 9 in. to above 1 ft. high, slender, often thickened into a bulb at the base, leafless except short loose sheathing scales at the base. Spikelets solitary, erect, ovoid, obtuse, 3 to 4 lines long and 2 lines diameter, the rhachis at length sometimes longer but denuded at the base, the lower glumes having fallen away. Glumes numerous, closely imbricate all round, oblong or rather broad, very obtuse, very finely striate but otherwise nerveless, thinly cartilaginous, 4 to 6 of the lower ones empty. Stamens 3. Style flattened, ciliate; branches 2 or rarely 3. Nut narrow-oblong, scarcely flattened, longitudinally striate and transversely cancellate.—F. Muell. Fragm. i. 194, viii. 274; *F. cylindrocarpa*, Kunth, Enum. ii. 222; Bœckel. in Linnæa, xxxvii. 7; *Trichelostylis xyroides*, Arn.; Hook. f. Fl. Tasm. Præf. 48.

N. Australia. Islands of the Gulf of Carpentaria, *F. Brown;* Providence Hill and Depot Creek, Upper Victoria River, *F. Mueller.*

Spreads over East India, Ceylon, and the Malayan Archipelago.

14. **F. trigastrocarya,** *F. Muell. Fragm.* i. 194.—Densely tufted, apparently annual. Stems filiform, 4 to 8 in. high, minutely pubescent. Leaves much shorter, filiform, with short open sheaths. Spikelet solitary, erect, ovoid or at length oblong-lanceolate, pale-brown, 3 to 4 lines long, nearly 1½ lines diameter. Glumes numerous, imbricate all round, membranous almost hyaline and spotted with brown, ovate or oblong, obtuse, nerveless except the midrib or keel, often produced

in the lower ones into a short point, the lowest 1 or 2 glumes or involucral bracts subulate, but shorter than the spikelet, and sometimes with scarious margins at the base, the lower part of the rhachis often denuded, the glumes and nuts being very deciduous. Stamens 3. Style scarcely flattened, glabrous; branches 3. Nut marked with 3 deep furrows so as to be almost 3-lobed, tuberculate, tapering at the base into a smooth stipes.

N. Australia. Depot Creek, Upper Victoria River, *F. Mueller.*

15. **F. monandra,** *F. Muell. Fragm.* i. 195.—Densely tufted and apparently annual. Stems filiform, 4 to 8 in. high, glabrous or here and there minutely pubescent. Leaves much shorter, numerous, filiform. Spikelet solitary, erect, ovoid or oblong, brown, 3 to 4 lines long, about 2 lines diameter. Glumes numerous, imbricate all round, very deciduous, ovate-oblong, obtuse, membranous almost hyaline, the midrib or keel slightly prominent, 2 lower empty ones narrow with a short subulate point but deciduous like the others. Stamen 1. Style slender, glabrous; branches 3 or in some flowers abnormally 4. Nut obovoid, prominently 3-ribbed, tuberculate, tapering into a short stipes.

N. Australia. Depot Creek, Upper Victoria River, *F. Mueller.*

16. **F. pterygosperma,** *R.Br. Prod.* 226.—Stems tufted, slender but rigid, 6 in. to 1 ft. high. Leaves much shorter, with short broad open sheaths or the inner one with a longer closed sheath. Spikelet solitary, erect, almost globular or at length conical, 2 to 3 lines diameter. Glumes numerous, closely imbricate all round, cartilaginous, nerveless, white or the inner ones tipped with brown, all very obtuse and broad, especially the outer ones, of which 4 to 6 are empty and rather larger than the flowering ones. Stamens 2 or 3. Style much flattened but glabrous; branches 3, short. Nut broadly obovate, truncate, stipitate, more or less flattened, with 3 prominent ribs, the two lateral ones often but not in all specimens fringed with a broad hyaline wing, marked with radiating striæ, the dorsal rib never fringed.—Bœckel. in Linnæa, xxxviii. 388.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* South Goulburn Island, *A. Cunningham;* Sturt's Creek, Upper Victoria River, *F. Mueller;* Arnhem Land, north coast, *M'Kinlay;* Port Darwin, *Schultz, n.* 790, 812.

17. **F. sphærocephala,** *Benth.*—Stems densely tufted, filiform, 3 to 6 in. high. Leaves much shorter, numerous, filiform, glabrous or minutely pubescent, with short open sheaths. Spikelet solitary, erect, globular and 1 to 1¼ lines diameter, or at length ovoid and 2 lines long, brown. Glumes numerous, closely imbricate all round, broadly obovate or orbicular, obtuse, membranous almost hyaline, shortly ciliate, the midrib or keel slightly prominent and in the 1 or 2 outer empty glumes produced into a short point. Stamen 1. Style hairy

but scarcely flattened; branches 3. Nut not seen ripe but showing 3 prominent ribs as in *F. monandra*.

N. Australia. Victoria River *F. Mueller;* Camden Harbour, *Martin.*
Queensland. Sunday Island, near Cape York, *A. Cunningham.*

18. **F. xyridis,** *R. Br. Prod.* 226.—Stems slender but rigid, 1 to 1¼ ft. high, pubescent at the base with short spreading hairs. Leaves rather numerous at the base of the stem and some half as long, flat and grass-like, shortly ciliate, the outer ones with short open sheaths, the innermost with a long close sheath. Spikelets solitary, nodding but terminal, ovoid or shortly cylindrical, very obtuse, 4 to 5 lines long, nearly 3 lines diameter, of a rich brown. Glumes very numerous and closely imbricate all round, obovate or orbicular, very obtuse, thinly membranous almost hyaline, the central nerve not prominent in the typical form and otherwise nerveless, the margins sometimes minutely pubescent, the 1 or 2 outer ones empty but nearly similar. Stamens 3 (or sometimes 2?). Style flattened but glabrous; branches 3. Nut oblong, triquetrous, smooth but not seen quite ripe.—Bœckel. in Linnæa, xxxviii. 389; F. Muell. Fragm. viii. 274.

N. Australia. Islands and mainland of the Gulf of Carpentaria, *R. Brown;* Arnhem Land, N. coast, *M'Kinlay;* Port Darwin, *Schultz, n.* 16, 177, 813; between Norman and Gilbert Rivers, *Gulliver.*

Var. *rigidula.* Glumes with a prominent rigid midrib and the spikelet apparently larger, but not fully out in the only specimen seen.—Fitzroy Island, *Walter.*

SECTION II. ABILDGAARDIA.—Spikelets erect, solitary or few, flat with distichous glumes or narrow and spiral with 2 or 3 rows of glumes. Style-bulb normal; branches usually 3.

19. **F. oxystachya,** *F. Muell. Fragm.* i. 195.—Stems densely tufted, slender, smooth, 4 in. to near 1 ft. high. Leaves much shorter, few and filiform, the sheathing scales at the base of the stem often scarious. Spikelet solitary, erect, oblong or narrow-lanceolate, slightly flattened, 5 to 6 lines long, 1 to 1½ lines broad. Glumes irregularly spiral or almost distichous, rigid but much thinner than in *F. monostachya* and almost scarious, lanceolate, acuminate or acute, the keel prominent and green, the sides pale brown or whitish and nerveless, the flowering ones nearly 3 lines long, 3 or 4 outer empty ones gradually shorter and broader, the lowest very small. Stamens 2 or 3. Style very shortly pubescent; branches 3. Nut obovoid, stipitate, 3-ribbed, prominently tuberculate.

N. Australia. Upper Victoria River, *F. Mueller.*

20. **F. macrantha,** *Bœckel. in Linnæa,* xxxviii. 388.—Stems tufted, 1 to 1½ ft. high, slender but rigid and scabrous. Leaves very much shorter, narrow-linear or subulate. Spikelet solitary, erect, oblong-

linear, scarcely flattened, about ½ in. long and 1½ lines broad. Glumes not very numerous, imbricate all round or irregularly spiral, scarcely distichous, cartilaginous, the keel prominent and produced into a minute erect point, the sides scarcely striate, the flowering ones scarcely 3 lines long, about 4 empty and gradually shorter and broader. Stamens 2 or 3. Style dilated, ciliate; branches 3. Nut obovoid, stipitate, 3-ribbed but somewhat compressed, tuberculate-punctate.

N. Australia. Victoria River. *F. Mueller;* Port Darwin, *Schultz, n.* 789, 814.

21. **F. squarrulosa,** *F. Muell. Fragm.* i. 216.—Stems tufted, 1 to 1½ ft. high, slender but rigid, leafless except the short erect subulate points of the sheathing scales, but intermixed with a few long narrow radical leaves. Spikelet solitary, erect, narrow-oblong, scarcely flattened, 6 to 9 lines long, scarcely 2 lines broad. Glumes not numerous, almost distichous or irregularly spiral, cartilaginous, the keel prominent and tapering into a spreading point, the sides nerveless or minutely striate, the longer flowering ones about 4 lines long, about 4 outer empty ones gradually shorter and broader. Stamens 3. Style scarcely dilated, minutely ciliate; branches 3. Nut stipitate, ovoid, obtuse, slightly 3-ribbed, prominently tuberculate when quite ripe.—*Abildgaardia schœnoides,* R. Br. Prod. 229.

N. Australia. Gulf of Carpentaria, *R. Brown;* Victoria River, *F. Mueller.*

22. **F. monostachya,** *Hassk. Pl. Jav. Rar.* 61.—Rhizome short, horizontal. Stems often thickened at the base, otherwise slender, from under 1 ft. to 1½ ft. high. Leaves shorter, very narrow. Spikelet solitary, erect, or rarely accompanied by a second or even a third pedicellate one, ovate or ovate-lanceolate, more or less flattened, pale or nearly white, 4 to 7 lines long, 2 to 3 lines broad. Glumes distichous or at length more or less spiral, cartilaginous, ovate, mostly 2 lines long, the keel prominent and produced into a short point, 1 or 2 lower empty ones narrow and more pointed. Stamens 3. Style slightly dilated, ciliate; branches 3 or 2. Nut rather large, obovoid or globular, obtusely 3-angled, tuberculate or almost muricate.—*Abildgaardia monostachya,* Vahl; Kunth, Enum. ii. 247; Bœckel. in Linnæa, xxxvii. 53; R. Br. Prod. 229; F. Muell. Fragm. viii. 272.

Queensland. East Coast, *R. Brown;* Port Curtis, *M'Gillivray;* Burnet River, *F. Mueller;* Rockhampton, *O'Shanesy, Thozet;* Herbert Creek, *Bowman;* Brisbane River, Moreton Bay, *F. Mueller. Leichhardt, C. Stuart.*

N. S. Wales. Paramatta, *Woolls;* New England, *C. Stuart;* Macleay River, *Beckler.*

The species extends over the tropical regions of the New and the Old World. F. Mueller, l. c., unites with it the three preceding species which, however, appear to me to be constantly distinct in the shape and structure of their spikelets.

23. **F. Brownii,** *Benth.*—Stems leafless except the sheathing scales at the base, slender, 1 ft. high or rather more. Spikelets 2 to 5, the central one sessile the others pedunculate. Involucral bract subulate not always present but sometimes longer than the inflores-

cence. Spikelets erect, ovate-lanceolate, very flat, pale brown, 4 to 5 lines long, 1½ to 2 lines broad, 3- to 12-flowered. Glumes regularly distichous, acute with a short fine point, keeled, the sides rigidly membranous, 1 or 2 outer empty ones shorter with longer points. Style-branches 3. Nut not seen.—*Abildgaardia vaginata,* R. Br. Prod. 229.

N. Australia. Islands off the N. coast of Arnhem Land, *R. Brown.*

24. **F. Dallachyi,** *F. Muell. Herb.*—A small tufted plant, apparently annual. Stems slender, 3 to 4 in. high. Leaves much shorter, rather numerous, narrow-linear but flat. Umbel simple, of 3 or 4 short filiform rays besides the sessile spikelet, the peduncles or rays shortly hirsute. Involucral bracts few and short. Spikelets very flat, lanceolate, acute, of a rich brown, about 3 lines long, 1 line broad, 8- to 12-flowered. Glumes very regularly distichous, navicular, lanceolate, acute, prominently keeled, the sides nerveless. Stamens 2 or 3. Style slender, shortly bulbous at the base, glabrous; branches 3. Nut obovoid, 3-ribbed, whitish, tuberculate.—*Abildgaardia fimbristyloides,* F. Muell. Fragm. viii. 273.

Queensland. Rockingham Bay, *Dallachy.* Very near the Indian *Abildgaardia fusca,* Nees (*A. fulvescens,* Thw.), of which it may be a variety, differing in its small size, flatter and more regularly distichous spikelets; the specimens are very few and not satisfactory.

SECTION III. DICHELOSTYLIS.—Spikelets several, usually numerous, but not clustered. Glumes imbricate all round the rhachis. Style-bulb normal; branches 2. Nut biconvex, smooth or rugose, not tuberculate.

25. **F. velata,** *R. Br. Prod.* 227.—Small densely tufted and apparently annual. Stems 3 to 6 in. high. Leaves much shorter, linear or setaceous, usually pubescent at least on the sheaths, rarely entirely glabrous. Umbel usually compound and rather compact, with slender rays and pedicels. Involucral bracts setaceous, much shorter than the inflorescence, or rarely 1 to 2 in. long. Spikelets solitary on the rays or pedicels, at first ovate-oblong and about 2 lines long, but often lengthening when old, scarcely 1 line broad, pale brown, glabrous or pubescent. Glumes rather closely imbricate all round, the very prominent keel produced into a short erect point. Stamen 1. Style slightly pubescent; the dilated base fringed with spreading hairs often long and closely reflexed over the ovary and nut; branches 2. Nut obovoid, usually brown, biconvex, minutely striate or cancellate.—Hook. f. Fl. N. Zel. i. 272; *F. dichotoma,* Hook. f. Handb. N. Zeal. Fl. 303, not of Vahl; *F. propinqua,* R. Br. Prod. 227.

N. Australia. Arnhem Land, *F. Mueller,* including specimens from South Alligator River, with much shorter hairs at the base of the style.

Queensland, *Mitchell;* Wide Bay, *Bidwill.*

N. S. Wales. Nepean and Paterson Rivers, *R. Brown;* Severn River, *Leichhardt;*

Clarence River, *Wilcox*; Richmond River, *Mrs. Hodgkinson*; Hawkesbury, *Woolls*; Darling River, *Dallachy* and others, Barcoo River, *Howitt's Expedition*.
Victoria. Avon River, *F. Mueller*.

Also in New Zealand and a closely allied plant in S. Africa. F. Mueller, Fragm. ix. 11, unites the Australian plant with the East Indian *F. squarrosa*, Vahl, which appears to me to be constantly distinct in the 3-nerved glumes tapering into a long recurved point, giving the spikelet a peculiar squarrose aspect. Bœckeler in Linnæa, xxxvii. 13, seems to have inadvertently referred Mitchell's specimens to a variety of *F. dichotoma*.

26. **F. æstivalis,** *Vahl; Kunth, Enum.* ii. 226.—Densely tufted and probably annual. Stems slender, 3 to 6 in. high or when luxuriant 8 or 9 in. Leaves much shorter, rather numerous, filiform, the sheaths and often the whole leaf pubescent or hirsute. Umbel nearly simple or compound, with filiform rays and pedicels. Involucral bracts filiform, slightly dilated at the base, 1 or 2 longer than the inflorescence or all shorter. Spikelets solitary on the rays or pedicels, of a light brown, at first ovate and only 1 line long, at length oblong and sometimes 2 lines long, under 1 line broad. Glumes loosely imbricate all round, membranous, the keel prominent often ciliate and produced into a short point, 1 or 2 outer ones empty. Stamen 1 (rarely 2?). Style glabrous or slightly ciliate near the end; branches 2. Nut obovate, biconvex, smooth or under a strong lens minutely reticulate.—Bœckel. in Linnæa, xxxvii. 11; F. Muell. Fragm. ix. 11; *F. pallescens*, Nees; Hook. f. Fl. Tasm. Præf. 48.

N. Australia. Near M'Adam Range, *F. Mueller*.
Queensland. Cape York, *M'Gillivray*; Rockingham Bay, *Dallachy*; Rockhampton and neighbourhood, *Bowman*, *O'Shanesy*.
N. S. Wales. New England, *C. Stuart*.
Victoria. Ovens and Goulburn Rivers, *F. Mueller*.

Var. ? *macrostachya*. Spikelets ovate or ovate-lanceolate, 2 to 3 lines long, 1½ lines broad.—Rockingham Bay, *Dallachy*; Russell River, *Herb. F. Mueller*.

The species ranges over tropical and subtropical Asia and the same or a very closely allied one is in America.

27. **F. dichotoma,** *Vahl; Kunth, Enum.* ii. 225.—Densely tufted and apparently annual. Stems from a few inches to nearly 1 ft. high. Leaves shorter, rather numerous, very narrow linear but flat, quite glabrous or the sheaths slightly ciliate. Umbel nearly simple or compound but not usually large, the longest rays ½ to 1 in. Involucral bracts narrow-linear, 2 or 3 longer than the inflorescence. Spikelets ovate, from 1 to 1½ lines long. Glumes imbricate all round but not very numerous, ovate, membranous, with a very prominent keel produced into a short erect point. Stamen 1. Style flattened, ciliate but the base glabrous; branches 2. Nut broadly obovate, biconvex, with 10 to 12 prominent longitudinal striæ and transversely cancellate.—Bœckel. in Linnæa, xxxvii. 12; Reichb. Ic. Fl. Germ. t. 315; F. Muell. Fragm. ix. 10; *F. parviflora*, R. Br. Prod. 227.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown.*

Queensland. Tarampa Creek, *F. Mueller;* Rockingham Bay, *Dallachy;* Herbert's Creek, *Bowman;* Moreton Bay, *C. Stuart.*

N. S. Wales. Richmond River, *C. Moore;* Glendon, *Leichhardt.*

Extends over the warmer regions of both the New and the Old World.

28. **F. depauperata,** *R. Br. Prod.* 227.—A small slender annual. Stems 4 to 6 in. high. Leaves numerous, very narrow but flat, the outer ones short and setaceous, the sheaths with rather long hairs. Umbel simple, of 3 or 4 slender rays ¼ to ½ in. long or reduced to a single spikelet. Involucral bract long, slender and erect with sometimes a second shorter one. Spikelets pale brown, ovate or ovate-lanceolate, 2 lines long or rather more. Glumes imbricate all round but not very numerous, broadly ovate, acute, membranous, the keel slightly prominent, the sides nerveless. Stamen 1. Style ciliate except at the base; branches 2. Nut broadly obovate, biconvex, marked with raised striæ and transversely cancellate.

N. Australia. Arnhem Land, north coast, *R. Brown.*

29. **F. spirostachya,** *F. Muell. Herb.*—Tufted and apparently perennial. Stems 1 to 1½ ft. high, rather slender, striate. Leaves much shorter, narrow but flat, the long sheaths usually hairy. Umbel compound, the rays numerous and slender, but the longest only 1 to 1½ in. long. Involucral bracts very narrow, 1 or 2 longer than the inflorescence. Spikelets ovate or ovate-lanceolate, pale brown, 3 to 6 lines long, about 2 lines broad. Glumes numerous, imbricate all round but the spiral arrangement usually very conspicuous, broad, thin but rather rigid and opaque, obtuse or very shortly mucronate, sometimes minutely powdery-pubescent, the keel prominent towards the top, the sides smooth or minutely striate. Stamens 3. Style flat, ciliate; branches 2. Nut obovate, biconvex, with rather thickened margins, longitudinally striate and transversely cancellate.

N. Australia. Upper Victoria River, *F. Mueller.* Allied to the East Indian *F. schœnoides,* Vahl, which, however, has only 1 to 3 spikelets to each stem.

30. **F. diphylla,** *Vahl, Enum.* ii. 289.—Stems from a perennial rhizome tufted, rather slender, often compressed, ¾ to 1½ ft. high, usually scabrous under the inflorescence. Leaves narrow-linear, from almost subulate to 1½ lines broad, rarely as long as the stem, mostly radical with short open sheaths. Umbel more or less compound or almost simple, loose with the longer rays 1 to 3 in., or crowded. Involucral bracts leafy, 1 or 2 often exceeding the inflorescence. Spikelets few or numerous, ovoid or oblong, usually brown and about 3 lines long and 1½ lines broad. Glumes closely imbricate all round, broad, rather rigid, shortly mucronate, the keel 1- or 3-nerved, the sides smooth. Stamen in the typical form 1, in some varieties 3. Style flattened, ciliate; branches 2. Nut obovate, much compressed but biconvex, whitish, distinctly striate and cancellate.—*F. variabilis,* R. Br.

Prod. 228; *F. communis*, Kunth, Enum. ii. 234; F. Muell. Fragm. ix. 10; *F. polymorpha*, Bœckel. in Linnæa, xxxvii. 14; *F. elongata* and *F. stricta*, R. Br. Prod. 228; *F. gracilis*, *F. tristachya* and *F. obtusifolia*. Nees in Sieb. Agrostoth. n. 2, 114, 117 (the two latter numbers West Indian).

N. Australia. Arnhem Land and Gulf of Carpentaria, *R. Brown*; Port Darwin, *Schultz*, *n.* 34, 178; Upper Victoria River, *F. Mueller*.

Queensland. Port Curtis and Percy Island, *M'Gillivray*; Rockingham Bay, *Dallachy*; Rockhampton and neighbourhood, *Thozet*, *Bowman* and others; Moreton Bay, *F. Mueller*, *Leichhardt* and others.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls* and others; New England, *C. Stuart*.

Var. *gracilis*. Leaves very narrow, glumes more membranous and paler coloured than in the ordinary form. Stamens usually 3.—*F. gracilis*, R. Br. Prod. 227; *F. Royeniana*, Nees (partly), Hook. f. Fl. Tasm. Præf. 48.—Keppel Bay, *R. Brown*; Darling River, *Dallachy*; Central Australia, *Giles*. Some specimens from the western interior of N. S. Wales appear intermediate between this and the typical form.

The species is common in the warmer regions both of the New and the Old World, extending into North America. The South European *F. annua*, Rœm. et Schult., united with it by Bœckeler, may however be specifically distinct.

31. **F. ferruginea,** *Vahl; Kunth, Enum.* ii. 236.—Perennial, glabrous and smooth. Stems rigid, striate, often slightly compressed, 1 to 2 ft. high. Leaves few, the narrow-linear lamina often erect and shorter than the brown membranous sheath. Umbel simple or slightly compound. Involucral bracts few, either all very short or 1 or 2 slightly exceeding the inflorescence. Spikelets few, rarely reduced to 1 or 2 or increased to about 12, dark or light brown, always rather large but varying in size from 4 lines long and 1½ lines broad to above ½ in. long and fully 2 lines broad. Glumes numerous, closely imbricate all round, broadly ovate or almost orbicular, membranous with a rather fine but prominent keel often produced into a short point, the sides nerveless or faintly striate, often minutely hoary-pubescent. Stamens 3. Style ciliate; branches 2. Nut obovate, much compressed but biconvex, usually with a thickened margin, quite smooth or under a strong lens very minutely striate and cancellate.—Bœckel. in Linnæa, xxxvii. 16; F. Muell. Fragm. ix. 10; *F. brevifolia*, R. Br. Prod. 228.

N. Australia. Near Providence Hill, *F. Mueller*.

Queensland. Rockingham Bay, *Dallachy*; Rockhampton, *Thozet* and others; Brisbane River, Moreton Bay, *F. Mueller*, *Leichhardt*.

N. S. Wales. Botany Bay, *Banks and Solander*; Richmond River, *Mrs. Hodgkinson*; near Mount Murchison, *Bonney*.

W. Australia. Murchison River, *Oldfield*.

Var. *foliata*. Leaves long though few and often only one, the sheaths often pubescent. Spikelets large.—*F. arvensis*, Vahl; Kunth, Enum. ii. 237; *F. tristachya*, R. Br. Prod. 226; *F. paucispicata*, F. Muell. Fragm. i. 197. Gulf of Carpentaria, *R. Brown*; Upper Victoria River, *F. Mueller*; Bowen Downs, *Birch*; Springsure, *Wuth*.

The species is dispersed over the warmer regions of the New and the Old World.

32. **F. denudata,** *R. Br. Prod.* 227.—Perennial and glabrous. Stems densely tufted, slender but rigid, 6 in. to nearly 1 ft. high, leafless except short sheathing scales or very rarely intermixed with a very few long setaceous leaves. Umbels simple, of 3 to 6 spikelets or one of the lateral rays bearing 2 spikelets distant from each other, the branches or rays as well as the spikelets erect. Involucral bracts short and glumelike or rarely produced into a short point. Spikelets brown, at first ovate-oblong and about 2 lines long, at length nearly cylindrical and 3 to 5 lines, scarcely 1 line diameter. Glumes numerous, imbricate all round, ovate or oblong, obtuse or shortly mucronate, the keel very prominent, the sides membranous. Stamens 2 or 3. Style flattened, ciliate; branches 2. Nut minute, obovate, biconvex, smooth or under a strong lens slightly rugose.—F. Muell. Fragm. ix. 9.

N. Australia. Arnhem Land, N. coast, *R. Brown;* Victoria River, *F. Mueller;* between Norman and Gilbert Rivers, *Gulliver.*

33. **F. elata,** *R. Br. Prod.* 227.—Perennial, glabrous. Stems slender, 1 to 1½ ft. high, leafless except sheathing scales. Umbels slightly compound, the rays not numerous, spreading, almost filiform, the longest 1 to 2 in. long. Involucral bracts small and glume-like. Spikelets ovate-lanceolate or at length oblong, 3 to 4 or even 5 lines long, pale brown. Glumes imbricate all round, ovate, obtuse, membranous, the keel not very prominent but often 3-nerved. Stamens 3. Style slender, shortly ciliate; branches 2. Nut minute, obovoid-globular, smooth, dark-coloured.

N. Australia. Arnhem Land, North Coast, *R. Brown.*

34. **F. cæspitosa,** *R. Br. Prod.* 228.—Perennial. Stems 6 to 10 in. high, slender. Leaves very much shorter, rather numerous, setaceous. Umbel simple or slightly compound, the rays slender, ½ to ¾ in. long. Involucral bracts very short and glume-like. Spikelets ovate or at length ovate-oblong, 2 to 3 lines long, nearly 1¼ lines broad. Glumes numerous, closely imbricate all round, membranous, ovate, obtuse or scarcely mucronate, the keel very slightly prominent, with a lateral nerve on each side in the lower glumes. Stamens 2 or 3. Style slender, scarcely ciliate; branches 2. Nut minute, biconvex, pale or dark coloured, smooth or under a strong lens minutely striate and cancellate.—*F. brachylæna,* F. Muell. Fragm. i. 199.

N. Australia. Arnhem Land and Gulf of Carpentaria, *R. Brown;* Upper Victoria River, *F. Mueller;* Sweers Island, *Henne.*

Queensland. Herbert River, *Armitage.*

F. Mueller, Fragm. ix. 9, unites this with *F. denudata* which it resembles in many respects, but the rather numerous setaceous leaves, the more numerous and differently shaped spikelets, and some other characters appear sufficiently to distinguish it.

SECTION IV. TRICHELOSTYLIS.—Spikelets few or many in a simple or compound umbel cluster or head rarely (in *F. spiralis* and *F. lepto-*

clada) reduced to a single spikelet. Glumes imbricate all round the rhachis. Style-bulb normal; branches 3 (except rarely in the *Glomeratæ*). Nut various.

SERIES I. OLIGOSTACHYÆ.—Spikelets few, occasionally solitary.

35. **F. spiralis,** *R. Br. Prod.* 226.—Apparently annual. Stems filiform, 2 to 3 in. high. Leaves as long, numerous, setaceous. Spikelets either solitary and erect or 2 together, the second on a short reflexed pedicel. Involucral bract short. Spikelets pale brown, lanceolate, acute, 4 to 5 lines long, nearly 1½ lines diameter. Glumes numerous, closely imbricate all round but the spiral arrangement often very distinct, obtuse, concave, thin, faintly striate or smooth, scarcely keeled. Stamens 2 or 3. Style glabrous or minutely ciliate; branches 3. Nut ovoid-oblong, tuberculate, finely 3-ribbed.

N. Australia. Arnhem Bay, *R. Brown.*

36. **F. subaristata,** *Benth.*—Apparently annual, glabrous. Stems slender, tufted, 3 to 4 in. high. Leaves much shorter, numerous, narrow-linear, spreading. Umbel simple, of few spreading rays on pedicels not exceeding ½ in. Involucral bracts linear-subulate, 1 often as long as the rays. Spikelets pale-coloured, ovate-lanceolate, 2 to 3 lines long. Glumes loosely imbricate all round, ovate or ovate-lanceolate, the keel very prominent and produced into a spreading point, often rather long and awn-like in the lower ones, shorter on the uppermost ones, the sides membranous, brown and sometimes with white scarious margins. Stamens 2 or 3. Style slender, glabrous; branches 3. Nut broadly obovoid, almost obcordate, very prominently 3-ribbed, granular-tuberculate, the granules usually in regular vertical rows.

N. Australia. Sturt's Creek, *F. Mueller.*

37. **F. leptoclada,** *Benth.*—Perennial and glabrous. Stems densely tufted, filiform, 6 in. to 1 ft. long, leafless except the sheathing scales which are mostly scarious especially in the upper part. Spikelets either solitary or with 1 rarely 2 additional pedicellate ones, lanceolate, pale brown, 4 to 6 lines long, 1½ to 2 lines diameter. Glumes imbricate all round, lanceolate or ovate-lanceolate, acuminate-acute, about 2 lines long, very thinly membranous almost scarious and hyaline on the sides, the keel prominent and sometimes a faint nerve on each side, about 2 lower ones shorter and empty and often the uppermost empty or with imperfect flowers. Stamens 3. Style slender, nearly glabrous, more ciliate at the base; branches 3. Nut obovoid, 3-ribbed, white, tuberculate.

Queensland. Rockingham Bay, *Dallachy;* Rockhampton, *O'Shanesy.* The spikelets are something like those of *F. androgyna*, but usually 2 or 3, the glumes acuminate and the style branches 3.

38. **F. debilis,** *F. Muell. Fragm.* i. 198.—Stems densely tufted, weak, almost filiform, 1 ft. long or more, leafless except rather loose sheathing scales sometimes produced into short erect laminæ. Umbel simple or slightly compound, of few rays, all short or the longest 1 in. long. Involucral bracts very short. Spikelets linear-lanceolate, pale brown, 3 to 5 lines long, about 1 line broad. Glumes not numerous, loosely imbricate all round, lanceolate, acuminate, with rather long fine erect or slightly spreading points, the keel prominent and often minutely ciliate, the sides scarious. Stamens usually 2. Style nearly glabrous; branches 3. Nut nearly globular, obscurely 3-angled, dark-coloured, coarsely tuberculate.

N. Australia. Depot Creek, Upper Victoria River, *F. Mueller.*

SERIES II. POLYSTACHYÆ.—Spikelets usually numerous, in more or less compound umbels, not clustered on the rays.

39. **F. corynocarya,** *F. Muell. Fragm.* i. 197.—Apparently perennial, glabrous. Stems angular or flattened, about 2 ft. high. Leaves almost distichous, very narrow, 2 or 3 as long as the stem or longer. Umbel compound, the longest rays 2 to 3 in. long. Involucral bracts very narrow, dilated at the base, 2 or 3 of them longer than the inflorescence and those of the partial umbels often rather long. Spikelets broadly ovate, pale brown, about 3 lines long and 2 lines broad. Glumes numerous, but rather loosely imbricate all round, broad, rather acute, rigid and obscurely 3-nerved in the centre, the broad sides thinly scarious and ciliate. Stamens 3. Style slender, minutely ciliate; branches 3. Nut obovoid-clavate, contracted into a long stipes, very prominently 3-ribbed, perfectly smooth.

N. Australia. Depot Creek, Upper Victoria River, *F. Mueller*, a single specimen in his herb.

40. **F. solidifolia,** *F. Muell. Fragm.* i. 198.—Glabrous and perhaps annual though 1 to 1½ ft. high. Leaves few, narrow, erect, flat or nearly terete, the longest sometimes as long as the stem. Umbels slightly compound, of few rays, the longest 1 to 1½ in. long. Involucral bracts narrow, shorter than the rays or 1 as long. Spikelets 1 to 3 on each ray, pale brown, broadly ovate and about 3 lines long, but the rhachis lengthening as the lower glumes fall away. Glumes numerous, imbricate all round but very concave and distinct, obtuse, the keel prominent but not thick, with usually a nerve on each side. Stamens 3. Style nearly glabrous; branches 3. Nut narrow-obovoid, clavate, 3-ribbed, prominently tuberculate almost muricate.

N. Australia. Sturt's Creek, *F. Mueller.*

41. **F. obtusangula,** *F. Muell. Fragm.* i. 198. — Very closely allied to *F. solidifolia* and perhaps a variety only. Stature the same. Leaves more numerous and shorter. Involucral bracts very short, the

longest 3 to 5 lines long, rigid and almost pungent. Inflorescence and spikelets the same. Style flattened and more ciliate. Nut broadly obovoid-clavate.

N. Australia. Depot Creek, Upper Victoria River, *F. Mueller.*
Queensland. Bowen Downs, *Birch.*

42. **F. miliacea,** *Vahl; Kunth, Enum.* ii. 230.—Apparently annual. Stems tufted, slightly or very prominently 4-angled, 6 in. to about 2 ft. high. Leaves from much shorter to nearly as long, linear, tapering to a fine point; the sheathing base broad and open. Umbel compound, sometimes small with the longest ray about 1 in., sometimes above 6 in. long and very compound, the ultimate rays or pedicels usually horizontally spreading. Involucral bracts small and linear or rarely 1 nearly as long as the ray. Spikelets globular or nearly so, from ¾ to nearly 1¼ lines diameter. Glumes numerous, closely imbricate all round, broadly ovate, membranous, obtuse or scarcely mucronate, the keel fine but prominent, and frequently a broad brown streak on each side, the margins pale, sometimes hyaline. Stamen 1. Style glabrous; branches 3. Nut small, obovoid, whitish, 3-ribbed, granular tuberculate or almost muricate.—Bœckel. in Linnæa, xxxvii. 43; F. Muell. Fragm. ix. 12; *Trichelostyles miliacea,* Nees; Hook. f. Fl. Tasm. Præf. 48.

N. Australia. Upper Victoria River and near M'Adam Range, *F. Mueller;* between Norman and Gilbert Rivers, *Gulliver.*
Queensland. Rockhampton, *O'Shanesy.*

Common in tropical Asia, the Mascarene Islands and in tropical America, but the Senegambian plant referred to it by J. D. Hooker is probably different.

43. **F. rara,** *R. Br. Prod.* 227. — Apparently annual. Stems angular, 1 to 2 ft. high. Leaves much shorter, few, the inner ones or sometimes all reduced to sheathing scales with short erect laminæ or points. Umbel compound, rather loose, 2 to 4 in. broad, the pedicels slender. Involucral bracts very short. Spikelets shortly ovoid, 1½ to 2 lines long, 1 line diameter. Glumes not near so numerous as in *F. miliacea,* loosely imbricate all round, broad, obtuse or shortly acuminate, keeled, the sides with broad hyaline margins. Stamens 3. Style glabrous; branches 3. Nut ovoid, 3-ribbed, granular-tuberculate.—*F. trachycarya,* F. Muell. Fragm. i. 199.

N. Australia. Arnhem Land, north coast, *R. Brown, Kinlay;* Depot Creek, Upper Victoria River, *F. Mueller.*

United by F. Mueller, Fragm. ix. 12, with *F. miliacea,* but the shape and structure of the spikelets, and the shape of the glumes, appear to me to be different, and I always find 3 stamens, whilst I have never seen more than 1, in the Australian specimens at least, of *F. miliacea.*

44. **F. microcarya,** *F. Muell. Fragm.* i. 200.—Apparently annual. Stems tufted, slender, angular, from 3 to 4 in. to above 1 ft. high. Leaves much shorter, rather numerous, flat and rather flaccid, from ½ line to nearly 1½ lines broad, with short open sheathing bases. Umbel

slender, irregular, but very compound, the rays and pedicels filiform, the longest rays 1 to 2 or rarely 3 in. long. Involucral bracts narrow and leafy but shorter than the rays. Spikelets not clustered but numerous, the smallest in the genus, brown, narrow-lanceolate, about ½ line long when first out, lengthening to 1 or 1½ lines or very rarely rather longer when old, not ½ line broad, with 6 to 12 or rarely more flowers. Glumes loosely imbricate all round, acuminate, the point sometimes slightly spreading, the keel very prominent and sometimes slightly ciliate, especially in the outer ones, one only empty. Stamen 1. Style nearly glabrous, branches 3. Nut obovoid, whitish, with 3 prominent ribs, usually tuberculate.—*F. cyperoides*, F. Muell. Fragm. ix. 11, not of R. Br.

N. Australia. Sturt's and Depot Creeks, Upper Victoria River, *F. Mueller*; between Norman and Gilbert Rivers, *Gulliver*.

Queensland. Port Denison, *Fitzalan*; Boyd River and Dry-Beef Creek, *Leichhardt*; Herbert's Creek, *Bowman*; Rockhampton and neighbourhood, *Thozet*, *O'Shanesy*; Springsure, *Wuth*.

45. **F. quinquangularis,** *Kunth, Enum.* ii. 229.—Stems tufted, rather slender, more or less distinctly 4- or 5-angled, 1 ft. high or more, smooth or scabrous. Leaves sometimes nearly as long, narrow, flat or concave, glabrous, sometimes all reduced to loose sheathing scales, tapering into short erect laminæ. Umbels compound, with very numerous small spikelets not clustered, the rays sometimes all short though slender, sometimes the longer ones attaining 3 in. Involucral bracts short or one nearly as long as the inflorescence. Spikelets ovoid or at length oblong, pale or dark brown, 1½ to 2 lines long, 6- to 12-flowered. Glumes loosely imbricate all round, ovate, obtuse or shortly mucronate, the broad keel prominent and usually with a dark line on each side, the sides membranous and the margins sometimes scarious. Stamens 1 or 2 (rarely 3?). Style slender, nearly glabrous: branches 3. Nut ovoid-globular, obtusely triquetrous, tuberculate.—Bœckel. in Linnæa, xxxvii. 42; *Trichelostyles quinquangularis*, Nees; Hook. f. Fl. Tasm. Præf. 48.

N. Australia. Upper Victoria River, *F. Mueller*.

Common in East India, extending to the Mascarene Islands. The Australian specimens have paler spikelets than the Indian ones, but I can perceive no other difference.

46. **F. cyperoides,** *R. Br. Prod.* 228.—Stems from a creeping rhizome slender but rigid, 6 in. to above 1 ft. high. Leaves not numerous, very narrow or subulate, erect, with long open sheaths. Umbel compound, with filiform rays, the longest about 1 in. long. Involucral bracts few, subulate, the longest much shorter than the inflorescence. Spikelets not clustered, narrow, acute, brown, 2 to 3 lines long, ½ to ¾ line broad, with 2 to 4 flowers. Glumes imbricate all round, erect, lanceolate, acute, membranous, keeled, the flowering ones about 2 lines long, 2 or 3 outer empty ones shorter, and 1 or 2 small empty ones above the flowers. Stamens 3. Style glabrous or nearly so, the bulbous base continuous and falling off with it as in the normal species;

branches 3. Nut obovoid-oblong, faintly 3-ribbed, whitish, rugose.—*F. cinnamometorum*, Kunth, Enum. ii. 229; (Bœckel. in Linnæa, xxxvii. 35;) *Abildgaardia cinnamometorum*, Thw. Enum. Pl. Zeyl. 347; *Abildgaardia fusca*, F. Muell. Fragm. viii. 273, not of Nees; *Fimbristylis biflora*, Bœckel. in Linnæa, xxxviii. 393.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; Providence Hill, *F. Mueller*; Port Darwin, *Schultz*, *n.* 658.
Queensland. Wide Bay, *Bidwill*; Rockingham Bay, *Dallachy*.
N. S. Wales. New England, *C. Stuart*; Clarence River, *Beckler*.

Also in the East Indian Peninsula and in Ceylon. It was by some mistake, probably from misnamed specimens, as are frequent among our Indian Cyperaceæ, that Thwaites referred the *Abildgaardia fusca*, Nees, to *A. cinnamometorum*, instead of to the *A. fulvescens*, Thw. The *F. cyperoides* is anomalous in the genus in its few flowers and the proportional number of empty glumes nearer that of *Rhynchospora*, but the style and other characters are quite those of *Fimbristylis*.

SERIES III. GLOMERATÆ.—Spikelets more or less clustered on the rays of the umbel and always a central sessile cluster of 2 or more in lieu of the ordinary single sessile central spikelet. Leaves usually numerous. Style-branches usually 3, but sometimes 2.

47. **F. furva,** *R. Br. Prod.* 228.—Probably perennial, glabrous and not glaucous. Stems tufted, 4 to 8 in. high, slightly flattened. Leaves shorter, numerous, more or less spreading, linear, flat, obtuse, flaccid, 1 to 1½ lines broad. Umbel small and dense but compound, with few short rays, the spikelets mostly in clusters of 2 or 3 but some solitary. Involucral bracts small and glume-like or 1 or 2 produced into short points. Spikelets brown, ovoid or ovoid-oblong, about 2 lines long. Glumes imbricate all round, broad, the keel prominent and produced into a point very short in the inner glumes, longer in the lower ones with frequently a nerve on each side, the broad sides membranous and smooth. Stamens 2 or 3. Style slender, ciliate in the upper part; branches 3. Nut not seen full grown.

Queensland. Booby Island, *Banks and Solander*; Rockingham Bay, *Dallachy*.

Closely allied to the widely-spread tropical *F. glomerata*, Nees, with which Bœckeler correctly unites *F. Wightiana*, Nees, but our plant has not the rigid channelled leaves which give a peculiar aspect both to the Asiatic and the African specimens of that species, and the style appears to be constantly 3-branched.

48. **F. cymosa,** *R. Br. Prod.* 228.—Perennial and glabrous. Stems slender but rigid, ½ to 1½ ft. high. Leaves much shorter, numerous at the base, narrow, erect, rigid and shining. Umbel compound, the rays and pedicels spreading. Involucral bracts lanceolate, with fine points or laminæ much shorter than the rays. Spikelets numerous, in clusters of 2 or 3 with solitary ones intermixed, ovoid, 1 to 1½ lines long, pale brown. Glumes not numerous, loosely imbricate all round, membranous, keeled, the lower ones acute or acuminate, the upper ones obtuse Stamens usually 3. Style slender, not ciliate; branches 3. Nut very small, acutely 3-angled, smooth or minutely granular.

N. Australia. Islands of the Gulf of Carpentaria and Prince of Wales' Islands, *R. Brown;* Escape Cliffs, *Hulse.*

Some of Hulse's specimens, apparently of the same species, have the rhachis of the old spikelets much lengthened, but all the lower glumes fallen away.

49. **F. multifolia,** *Bœckel. in Linnæa,* xxxviii. 397.—Rhizome or stock thick, covered with the remains of old leaf-sheaths. Stems slender but rigid, triquetrous or flattened, 1 to 1½ ft. high. Leaves crowded at the base of the stem and shorter, glaucous but glabrous, narrow, subulate-acuminate, with short open sheaths. Umbel irregularly compound, the longest rays 1½ to 2 in., the spikelets in little clusters or heads of 3 to 10. Involucral bracts subulate-acuminate, dilated at the base, the longest much shorter than the rays. Spikelets ovoid, 1 to 1½ lines long, 8- to 10-flowered. Glumes loosely imbricate, membranous, obtuse, prominently keeled, the sides pale-brown, without scarious margins. Stamens 3? Style scarcely pubescent, very slightly bulbous at the base; branches 3 (or 2?), short. Nut ovoid-globular, obtusely 3-angled, whitish, minutely granular.

N. Australia. Cygnet Bay, N. W. coast, *A. Cunningham;* Port Darwin, *Schultz, n.* 147, 799.

Very closely allied to the common Indian *F. juncifolia,* Kunth, (*Trichelostyles,* Nees), in which Bœckeler correctly includes *F. chætorhiza,* Nees, our plant differing slightly in its longer leaves, smaller spikelets, shorter glumes, etc.

50. **F. sericea,** *R. Br. Prod.* 228.—Rhizome or stock thick and covered with the remains of old leaf-sheaths. Stems 6 in. to 1 ft. high, rigid, angular, striate, silky-pubescent or at length glabrous. Leaves much shorter, crowded at the base of the stem, linear, thick, 1 to 2 lines broad, obtuse, silky-pubescent on the underside and sheaths. Umbel irregularly compound, the longer rays about 1½ in., the spikelets in little clusters of 3 to 10. Involucral bracts lanceolate, acuminate, silky-hairy, much shorter than the rays. Spikelets about 2 lines long, with 2 or 3 perfect flowers. Glumes lanceolate or ovate-lanceolate, acute, navicular, prominently keeled, the sides nerveless, 2 outer ones shorter and empty and 1 or 2 upper ones also empty. Stamens 3. Style very shortly hairy; branches 3 (or 2). Nut not seen.—Bœckel. in Linnæa, xxxvii. 22.

N. Australia. Gulf of Carpentaria, *R. Brown;* Upper Victoria River, *F. Mueller;* Port Darwin, *Schultz, n.* 602.

Bœckeler refers to this species the *F. decora,* Nees, Kunth, Enum. ii. 240, from S. China and Java, in which he is probably right. The Australian plant has generally but not always 3 style-branches as described by Brown, whilst in the Chinese ones I have found only 2 in the spikelets examined, as described by Nees, Kunth, and Bœckeler.

51. **F. macrostachya,** *Bœckel. in Linnæa,* xxxviii. 386.—Perennial, glabrous but glaucous. Stems slightly angular or flattened, rigid, about 1 ft. high. Leaves shorter or nearly as long, narrow, rigid, flat or concave, with broad scarious sheaths truncate at the orifice. Spike-

lets large, in a dense cluster of 2 to 5, with 1 or 2 short lateral rays or pedicels bearing each 1 or 2. Involucral bracts short and rigid, the longest erect but shorter than the inflorescence. Spikelets oblong or ellipsoid, obtuse, 3 to 4 lines long, 1½ to 2 lines diameter, pale brown. Glumes numerous, closely imbricate all round, broadly ovate, mucronate-acute or almost obtuse, rigid, the keel prominent, the sides striate, about 4 lower ones shorter and empty. Stamens 2 or 3. Style much flattened, ciliate; branches 2. Ovary contracted at the base, the full-grown nut unknown.

N. Australia. Port Darwin, *Schultz, n.* 664.

52. **F. Neilsoni,** *F. Muell. Fragm.* ix. 79.—Glabrous. Stems 1 ft. high or more. Leaves shorter, narrow, with broad scarious sheaths obtuse at the orifice. Spikelets large, in a dense cluster of 3 to 5, with 2 or 3 short lateral rays or pedicels, bearing each 3 or 4, forming a simple umbel. Involucral bracts rarely longer than the inflorescence. Spikelets ovate, 4 to 5 lines long. Glumes rather loosely imbricate, ovate, obtuse, membranous, hyaline towards the margin, the lower ones 2 lines long. Stamens 3. Style slender, glabrous; branches 3. Nut clavate-pyriform, 3-angled, pale-coloured, tuberculate.

N. S. Wales. In the interior, between the Darling and Barcoo Rivers, *Neilson,* between Rome and the Barcoo, *Birch.* Very closely resembles *F. macrostachya*; but differs in the thinner glumes, with broad hyaline margins, and in the slender glabrous and 3-branched styles.

SERIES IV. CAPITATÆ.—Spikelets collected in a single terminal head.

53. **F. capitata,** *R. Br. Prod.* 228.—Stems tufted, rather slender, often 1 ft. high. Leaves much shorter, few, linear, with short open sheaths, or reduced to sheathing scales. Head of spikelets dense and globular, 4 to 6 lines diameter, either terminal concealing the very short bract, or appearing lateral owing to the involucral bract continuing the stem and sometimes twice as long as the head, or the inflorescence proliferous emitting a short branch with a second head. Spikelets brown, ovate or oblong, 2 to 3 lines or when old 4 lines long, 1½ to 2 lines broad. Glumes loosely imbricate in few rows, membranous, prominently keeled, obtuse or minutely pointed, the sides nerveless, 1 or sometimes 2 smaller outer ones empty. Stamens 3. Style glabrous or nearly so, the basal dilatation very small; branches 3. Nut obovoid-globular, the angles not prominent, tuberculate.—*F. cephalophora,* F. Muell. Fragm. i. 196.

N. Australia. Upper Victoria and Fitzmaurice Rivers, *F. Mueller.*
Queensland Endeavour River, *Banks and Solander.*

54. **F. Schultzii,** *Bœckel. in Linnæa,* xxxviii. 391.—Stems tufted, slender, 4 to 6 in. high. Leaves much shorter, rather numerous, narrow-linear but flat, with short open sheaths. Head of spikelets terminal, globular or at first hemisphærical, 3 to 5 lines diameter. In-

volucral bracts 4 or more, linear, spreading or reflexed, 1, 2 or sometimes 3 longer than the head. Spikelets numerous, sessile, ovate, more or less flattened, 1½ to 3 lines long, about 1¼ lines broad. Glumes not numerous, loosely imbricate, the prominent keel produced into a short or long more or less recurved point, the sides nerveless, thin with scarious hyaline margins. Stamens 2 or 3. Style glabrous; branches 3. Nut obovoid, 3-ribbed, minutely granular or almost smooth.—*F. platystachys*, Bœckel. in Linnæa, xxxviii. 390.

N. Australia. Sturt's Creek, *F. Mueller*; Port Darwin, *Schultz*, *n.* 96, 792.

The two numbers gathered by Schultz are distinguished as species by Boeckeler, and the separation is apparently justified by the specimens in the Berlin herbarium, but those of the Kew herbarium differ much less from each other, and F. Mueller's specimens are quite intermediate in most respects. The length of the involucral bracts and the points of the glumes upon which the distinctions are chiefly founded are so variable, that I am unable to give tangible characters even for two distinct varieties.

SECTION IV. ONCOSTYLIS.—Spikelets capitate, umbellate, or in species not Australian solitary. Glumes imbricate all round the rhachis. Style-bulb articulate on the nut, but often persisting a long time after the fall of the style.

I have followed Asa Gray in transferring this section from *Scirpus* (*Isolepis*) to *Fimbristylis*, of which it has entirely the habit, as the style-bulb, though persistent at first, very frequently falls away at the maturity of the nut.

55. **F. barbata,** *Benth.*—Apparently annual. Stems tufted, filiform, 3 to 8 in. high. Leaves much shorter, filiform, the sheaths loose at the apex and ciliate or bearded with long hairs. Spikelets 6 to 10 together in a single terminal sessile cluster or head. Involucral bracts few, filiform, 1 rather longer than the head. Spikelets brown, erect, narrow, 2 to 3 lines long. Glumes not numerous, erect, loosely imbricate, the very prominent usually 3-nerved and pale-coloured keel produced into a slightly recurved point, the sides membranous, almost scarious, nerveless. Stamen usually 1. Style glabrous; branches 3. Nut obovoid, slightly granular, the minute bulbous base of the style long persistent, but articulate on the nut and sometimes falling away at maturity.—*Scirpus barbatus*, Rottb.; Bœckel. in Linnæa, xxxvi. 751; *Isolepis barbata*, R. Br. Prod. 222; Kunth, Enum. ii. 208; F. Muell. Fragm. ix. 7.

N. Australia. Gulf of Carpentaria, *R. Brown*; Dampier's Archipelago, *Walcott*; Depot Creek, Upper Victoria River, *F. Mueller*; Port Darwin, *Schultz*, *n.* 170, 211.

Queensland. Bustard Bay, *Banks and Solander*; Rockingham Bay, *Dallachy*; Dawson River, *F. Mueller*; Dry Beef Creek, *Leichhardt*; Gainsford, *Bowman*; Bowen Downs, *Birch*.

N. S. Wales. Clarence River, *Wilcox*.

Central Australia. Between Alice Springs and Charlotte Waters, *Giles*.

Widely spread over the tropical regions of the Old World.

56. **F. capillaris,** *A. Gray, Man. Bot. N. U. S. ed.* 5, 567.—Annual. Stems tufted, filiform, 3 to 9 in. high. Leaves much shorter, numerous, filiform. Umbel simple or slightly compound, of few short filiform rays. Involucral bracts small and glume-like, or 1 or 2 produced into a filiform point shorter than the inflorescence. Spikelets ovoid-oblong, about 2 lines long, not clustered. Glumes not numerous, loosely imbricate, the keel very prominent, pale-coloured, produced into a minute slightly spreading point, the sides brown and nerveless. Stamens 2 or 3. Style slender, glabrous; branches 3. Nut small, obovoid, prominently 3-angled, very obtuse, the minute bulbose base of the style articulate but long persistent, usually however falling off at maturity.—*Scirpus capillaris*, Linn.; Bœckel. in Linnæa, xxxvi. 759; *Isolepis capillaris*, Rœm. et Schult.; Kunth, Enum. ii. 211; F. Muell. Fragm. ix. 7.

Queensland. Rockingham Bay, *Dallachy*; Sandy Creek, *Herb. F. Mueller.*
W. Australia, *Drummond*, *n.* 916.

Widely spread over the tropical and subtropical regions of the New and the Old World, extending into the more temperate districts of North America.

5. SCIRPUS, Linn.

(Isolepis, *Br.*; Malacochæte, *Nees.*)

Spikelets clustered, irregularly umbellate or rarely solitary, with several usually many hermaphrodite flowers. Glumes imbricate all round the rhachis, all flowering or the lowest 1 rarely 2 empty. Hypogynous bristles none or 3 to 8, ciliate with minute reflexed hairs or flattened into plumose scales. Stamens 3, 2 or 1. Style deciduous, more or less divided into 2 or 3 filiform stigmatic branches, the base scarcely thickened, continuous with the nut and remaining as a small point or tubercle. Nut obovoid globular triquetrous or flat.—Small tufted annuals, or if perennials sometimes tall and stout, the rhizomes often creeping or sometimes slender long and floating. Leaves few at the base of the stems or in tufts on the rhizome; sometimes reduced to an appressed sheath with or without a short lamina, sometimes very long. Inflorescence sometimes terminal with 2 or more unequal long involucral bracts as in *Cyperus*, more frequently more or less lateral with one erect involucral bract continuing the stem, in a few species the bract subtending the solitary terminal spikelet is short and glume-like.

The genus is truly cosmopolitan, thriving alike within the tropics, and in Arctic, Antarctic, and Alpine regions, mostly in marshes, sometimes actually in water, rare in dry localities. Of the twenty-three Australian species eight only are endemic, four more are also found in New Zealand or South Africa or both, and one of these also in extratropical South America, the remaining eleven belong generally to the tropical temperate or cold regions of the Old World, at least seven of them being also found in America.

I have followed Asa Gray and Bœckeler in reuniting *Isolepis* with *Scirpus*, for the sole character by which they are distinguished, the absence of the bristles in the former, is variable in two or three species, and in other instances separate species so closely allied that Bœckeler has united them as varieties. In the great majority of species however the character is so constant and so frequently attended by a difference in inflorescence, that there is a convenience in retaining the two groups at least as artificial sections. On the other hand, Nees' section or genus *Oncostylis*, retained by Bœckeler in *Scirpus*, appears to me to be much more naturally referred by Asa Gray to *Fimbristylis*, of which it has the inflorescence, and the bulbous base of the style, although often long persistent on the nut, is articulate with it, and often falls off from the perfectly ripe fruit.

SECT. I. **Isolepis.**—*No hypogynous bristles* (*except very rarely in* S. supinus). *Small or slender plants* (*except the last few species*).

- Spikelets small, in numerous dense heads, almost radical in a tuft of grass-like filiform involucral bracts . . 1. *S. humillimus.*
- Spikelets solitary. Style-branches 2. Nut biconvex. Stamens usually 3.
  - Spikelet narrow, few-flowered, 1 to 2 lines long. Stem or filiform rhizome often elongated and floating . . . . 2. *S. fluitans.*
  - Spikelet ovate, dark-brown, under 2 lines long. 10–16 flowered. Glumes broad many-nerved . . 3. *S. arenarius.*
  - Spikelet ovate, pale-brown, under 2 lines long, 3- to 5-flowered . . . . 4. *S. lenticularis.*
  - Spikelet ovate, 2 to 4 lines long, many-flowered. Nut orbicular, biconvex in the centre only, the edge thickened . . . . 5. *S. crassiusculus.*
- Spikelets solitary or clustered. Style-branches 2. Nut very flat. Stamens 2. Spikelet compressed.
  - Spikelet solitary ovate and terminal . . . . 6. *S. brizoides.*
  - Spikelets clustered or rarely solitary, narrow-oblong usually lateral . . . . 7. *S. cyperoides.*
- Spikelets solitary or clustered, small, (1 to 2 lines) ovoid or ovoid-oblong, terminal or nearly so. Style-branches 3 rarely 2.
  - Stamens 3 rarely 2. Glumes prominently keeled.
    - Nut very small, obovoid globular or 3-ribbed; marked with longitudinal furrows. Spikelets 1 to 3 . . . . 8. *S. setaceus.*
    - Nut very small, obtusely triquetrous, smooth. Spikelets 1 to 3 . . . . 9. *S. riparius.*
    - Nut acutely triquetrous. Spikelets solitary or clustered . , ... 10. *S. cartilagineus.*
  - Stamens 1 or 2. Spikelets clustered. Glumes narrow with long recurved points. Nut very narrow . . 11. *S. squarrosus.*
  - Stamen 1. Spikelets usually clustered, sometimes proliferous. Glumes broad. Nut acutely triquetrous . 12. *S. inundatus.*
- Spikelets clustered, above 2 lines long, oblong or narrow. Style-branches 3.
  - Spikelets in a terminal frequently proliferous cluster . . . . 13. *S. prolifer.*
  - Spikelets in a lateral cluster.
    - Stems continuous, not thick. Spikelets few in the cluster. Nuts transversely wrinkled . . . . 14. *S. supinus.*
    - Stems pithy with transverse septa inside. Spikelets in dense clusters. Nuts smooth . . . . . 15. *S. articulatus.*

Spikelets small and very numerous in a dense globular lateral cluster . . . . 16. *S. nodosus.*

SECTION II. **Euscirpus.** *Hypogynous bristles* 3 *to* 8. *Plants mostly tall and stout.*

Spikelets in sessile lateral clusters.
  Stems terete. Style-branches 2. Nut flat . . . . 17. *S. debilis.*
  Stem acutely 3-angled. Style-branches 3.
    Spikelets many. Glumes entire . . . . 18. *S. mucronatus.*
    Spikelets usually 3. Glumes mostly emarginate or 2-lobed . . . . 19. *S. pungens.*
Spikelets in a terminal or nearly terminal simple or compound irregular umbel or cluster.
  Involucral bract very short, erect and rigid. Style-branches 2.
    Bristles filiform, with short reflexed cilia . . . . 20. *S. lacustris.*
    Bristles or scales flattened, plumose with lax hairs . . . . 21. *S. littoralis.*
  Involucral bracts several, unequal, leaflike. Style-branches 3.
    Spikelets few and large (6 to 7 lines). Hypogynous bristles short . . . . 22. *S. maritimus.*
    Spikelets very numerous in a compound inflorescence 3 to 4 lines long. Hypogynous bristles very long, capillary and flexuose . . . . . 23. *S. polystachyus.*

SECTION I. ISOLEPIS.—Hypogynous bristles none or small and rare.

The greater number of the Australian species are small or slender, often annual and very different in aspect from the large typical *Scirpi*, but the two or three last of the following species assume the habit of the first two or three *Euscirpi* and the bristles are sometimes present in *S. supinus*, whilst they are occasionally very small or deficient in *S. debilis.*

1. **S. humillimus,** *Benth.*—A dwarf plant forming dense tufts with numerous small heads of spikelets, apparently radical at the base of grass-like linear-filiform involucral bracts 1 to 2 in. long, the real stems either undeveloped or from $\frac{1}{4}$ to $\frac{1}{2}$ in. long, and leafless below the inflorescence. Heads of spikelets 2 to 3 lines diameter, the depressed cluster of heads often 1 to 2 in. diameter. Involucral bracts several to each cluster, the outer ones slightly dilated at the base, erect and numerous enough in the plant almost to conceal the inflorescence. Spikelets 1 to $1\frac{1}{2}$ lines long, all sessile and numerous in the head. Glumes numerous, imbricate all round but spreading at the apex, oblong, rather obtuse, membranous with a dark centre forming a slightly prominent keel towards the end. No hypogynous bristles. Style-branches 3. Nut very small, rather broad, triquetrous, tipped with a small point.—*Isolepis acaulis*, F. Muell. in Herb. Kew.; Hook. f. Handb. N. Zeal. Fl. 302 in obs., not of Philippi.

N. Australia. South Alligator River, Arnhem Land, *F. Mueller.* This curious little plant has much of the aspect of the New Zealand *Isolepis basilaris*, Hook. f., and something of the habit of the *S. acaulis*, Bœckel. from Chili, but perfectly distinct in many characters from both. F. Muell. Fragm. ix. 7, includes it in *Isolepis Micheliana* (*Cyperus pygmæus*) from which it appears to me to be much further removed.

2. **S. fluitans,** *Linn.; Bœckel. in Linnæa,* xxxvi. 485.—Rhizomes filiform, elongated when in water and floating in large masses with tufts of 2 or 3 leaves at the nodes, when growing out of water the rhizome scarcely developed. Leaves filiform, 1 to 2 in. long, dilated at the base into a short open sheath. Stems or peduncles about the length of the leaves, one in each tuft. Spikelet solitary, terminal, pale-coloured or dark-brown, ovate-oblong, 1½ to 2 lines long with 4 to 8 flowers in the typical form. Glumes obtuse or scarcely acute, finely or obscurely striate, with a dorsal keel, all flowering except the lowest which is similar to the others or rather longer, very rarely produced into an erect linear lamina of 2 or 3 lines. Stamens 3. Style-branches 2. Nut ovate or broad, usually white, biconvex, tipped by a very small point or tubercle.—Reichb. Ic. Fl. Germ. t. 298; *Isolepis fluitans,* R. Br. Prod. 221; Kunth, Enum. ii. 188; Hook. f. Fl. Tasm. ii. 86.

N. S. Wales. Port Jackson, *R. Brown, Woolls;* New England, *C. Stuart.*
Victoria. Near Mount William, *Sullivan.*
Tasmania. Abundant in rivers and pools throughout the island, *J. D. Hooker.*
S. Australia. Tamunda, *F. Mueller;* Macclesfield, *Blandowski.*

Var. *terrestris,* F. Muell. Stems tufted, the rhizome scarcely developed. Spikelets fully 2 lines long, with rather more flowers than in the typical form.—*Isolepis lenticularis,* Hook. f. Fl. Tasm. ii. 86, t. 145, not of R. Brown.—Near Mount Macedon, *F. Mueller;* near Mount William, *Sullivan;* near Formosa, *Gunn;* South Esk River, *C, Stuart.*

Var. *microstachya.* Rhizome leaves and peduncles as in the typical form, but more capillary. Spikelet scarcely 1 line long.

N. S. Wales. Port Jackson, *C. Moore.*
Victoria. Upper Robinson and Yarra Rivers, *F. Mueller.*
W. Australia. *Drummond, n.* 322, 362; Tweed River, *Oldfield.*

The species is spread over the tropical and temperate regions of the Old World.

3. **S. arenarius,** *Benth.*—A dwarf rather rigid plant, the stems loosely tufted on a short but slender creeping rhizome, 1 to 2 in. high, leafless except a rather loose brown sheath oblique at the orifice, with a very short erect obtuse lamina. Spikelet solitary, terminal, erect or oblique, ovate, 1 to 1½ lines long, usually dark brown, 10- to 16-flowered. Glumes short and broad, almost orbicular, concave, obtuse, not striate, very obscurely keeled towards the end, the empty one or subtending bract erect but not very different from the others, rarely produced into a short point. No hypogynous bristles. Style-branches 2. Nut orbicular, white, biconvex, the terminal point exceedingly minute.

Victoria. Wet sands, Wilson's Promontory, *F. Mueller.*
W. Australia, *Drummond, n.* 360.

Var? *setiformis.* Stems filiform, densely tufted, leaf-sheaths with a slender point of 2 to 4 lines.—Mount Barker, W. Australia, *Oldfield.* Perhaps a distinct species.

4. **S. lenticularis,** *Spreng. Syst.* i. 208.—Stems filiform, 1 to 3 in. high. Leaves shorter, 1 on each stem but numerous in the tuft. Spikelet solitary, lateral but erect, the involucral bract erect, linear, 2 to 3 lines long and rather broad, the spikelet oblong or ovate, 1 to 1½ lines long, with only 3 to 5 flowers. Glumes ovate acuminate or ovate-lanceolate, loosely imbricate, keeled, finely striate. No hypogynous bristles. Stamens 2 or 3. Style-branches 2. Nut oval, nearly as long as the glume, biconvex, smooth, pale-coloured.—*Isolepis lenticularis,* R. Br. Prod. 222.

N. S. Wales. Port Jackson, *R. Brown.*

5. **S. crassiusculus,** *Hook. f.*—Rhizome stemlike, creeping and rooting at the nodes or elongated under water, not so slender as in *S. fluitans,* and apparently not floating. Leaves long and linear or sometimes filiform, but longer and usually stouter than in *S. fluitans.* Stem 3 to 5 in. long. Spikelet solitary, terminal, pale brown or greenish, ovate, 3 to 4 lines long, usually with twice as many flowers as in *S. fluitans.* Glumes ovate-oblong, obtuse, distinctly striate, obtusely keeled, the margins often scarious. No hypogynous bristles. Stamens 3. Style-branches 2. Nut very flat, nearly orbicular, slightly biconvex in the centre, thinner towards the margin and there thickened into an obtuse edge, the terminal point rather long.—*Isolepis crassiuscula,* Hook. f. Fl. Tasm. ii. 86. t. 143.

Victoria. Haidinger Range and Munyong Mountains, *F. Mueller.*
Tasmania. Arthur Lakes and Mount Wellington, *Gunn;* sources of the Derwent, Lake St. Clair, *Gulliver.*

6. **S. brizoides,** *Benth.*—Stems tufted, 2 to 4 in. high, with a single short narrow leaf. Spikelet solitary, terminal, ovate, usually brown, 2 to 3 lines long, 1½ to 2 lines broad, considerably flattened, the subtending bract very short. Glumes imbricate all round or almost in 3 rows, broader than in *S. cyperoides,* the keel scarcely prominent. No hypogynous bristles. Stamens 2. Style-branches 2. Nut nearly orbicular, flat or slightly biconvex.

W. Australia. Swan river? *Drummond, n.* 919; Vasse River, *Oldfield.* Very near *S. cyperoides,* but as far as the specimens show appears distinct in inflorescence as well as in the shape of the spikelet.

7. **S. cyperoides,** *Spreng. Syst.* i. 208.—Stems tufted, usually 3 to 6 in. high, with a single narrow leaf much shorter than the stem. Spikelets in a cluster of 3 to 6, at first terminal but usually thrown to one side by the longer erect involucral bract sometimes ½ to 1 in. long,

the second bract much shorter, rarely the spikelet solitary and lateral, shorter than the involucral bract. Spikelets oblong-lanceolate, 3 to 4 lines long, rather more than 1 line broad, more or less flattened. Glumes imbricate all round or almost in 3 rows, erect, the keel prominent green and usually produced into a short erect point, the sides striate, often brown. No hypogynous bristles. Stamens 2. Style-branches 2. Nut brown, flat or biconvex.—*Isolepis cyperoides*, R. Br. Prod. 222.

W. Australia. King George's Sound and neighbouring districts, *R. Brown*, *Drummond*, *n.* 43 and 920, *Oldfield*, *F. Mueller.*

8. **S. setaceus**, *Linn.; Bœckel. in Linnæa*, xxxvi. 500 *partly.*—Stems tufted, filiform or subulate, mostly 1 to 3 in. but sometimes 6 to 8 in. long. Leaves few, short and filiform. Spikelets solitary or 2 or 3 together, terminal or more frequently thrown to one side, the principal or only involucral bract erect and continuing the stem, sometimes very short sometimes ½ in. long. Spikelets ovate or lanceolate, 1½ or rarely 2 lines long. Glumes few, the keel prominent and often produced into a very short point, the sides nerveless or faintly nerved, brown or more frequently pale coloured. No hypogynous bristles. Stamens 3, rarely 2. Style-branches 3. Nut small, globular or obovoid, more or less distinctly 3-ribbed and marked by longitudinal striæ or furrows.—Reichb. Ic. Fl. Germ. t. 301; *Isolepis setacea*, R. Br. Prod. 222; Kunth, Enum. ii. 193; Hook. f. Fl. Tasm. ii. 88; *I. multicaulis*, Schlecht. Linnæa, xx. 562.

N. S. Wales. Macleay River, *Beckler;* Clarence River, *Wilcox;* New England, *Perrott.*

Victoria. Snowy River, *F. Mueller*, near mount William, *Sullivan.*

Tasmania. Near Penquite, *Gunn;* Southport, *C. Stuart.*

S. Australia. Barossa Range, *Behr.* I have not seen these specimens, but Schlechtendahl expressly describes the nuts of the typical *S. setaceus.*

W. Australia. Stirling Range, *F. Mueller.*

The typical form, often confounded with *S. riparius*, has been satisfactorily identified in various parts of the Old World, chiefly in extratropical regions in the southern as well as in the northern hemisphere.

9. **S. riparius**, *Spreng. Syst.* i. 208.—Very closely allied to *S. setaceus* and referred to it as a variety by *Bœckeler*, differing only in the nut, which is smooth or minutely granular, without the prominent striæ and furrows of *S. setaceus.* It varies much in form, sometimes globular or obovoid as in *S. setaceus*, sometimes obtusely but equally triquetrous or more frequently in Australian specimens with a broad inner face, the back very convex or obtusely angled but these forms pass so gradually one into another as to make it very difficult to sort the specimens into distinct varieties. The nut is always shorter and never so prominently 3-angled as in *S. cartilagineus.*—*Isolepis riparia*, R. Br. Prod. 222; Nees in Pl. Preiss. ii. 74; Hook. f. Fl. Tasm. ii. 89, t. 145, c.; *I. Saviana*, Schult.; Kunth, Enum. ii. 193; Hook. f. l. c. ii. 88;

Scirpus setaceus, var. Bœckel. in Linnæa, xxxvi. 502; *S. Savii*, Spreng. Syst. i. 207; Reichb. Ic. Fl. Germ. t. 301; *Isolepis congrua*, Nees in Pl. Preiss. ii. 75 (according to Bœckeler).

N. S. Wales. Port Jackson, *R. Brown*, and probably from thence also, *Sieber* (Agrostoth. n. 20).

Victoria. Wendu Vale, *Robertson*; Wimmera, *Dallachy*; Murray River, *F. Mueller*, and numerous scattered localities, *F. Mueller* and others.

Tasmania. Kent's Group, Bass's Straits, *R. Brown*; abundant in wet places, *J. D. Hooker* and others.

S. Australia. Mount Lofty, Bethanie, etc., *F. Mueller*.

W. Australia, *Drummond*, *n.* 361; Preiss, n. 1729 (with filiform stems 10 in. long); Blackwood River, *Oldfield*.

The species is dispersed over the New as well as the Old World, chiefly however without the tropics.

10. **S. cartilagineus,** *Spreng. Syst.* i. 208.—Stems slender, almost filiform, densely tufted, usually 1 to 3 in. but sometimes at least twice as high. Leaves much shorter, few and filiform or all reduced to sheathing scales with a short erect point. Spikelets 3 to 6 together in a terminal cluster, or in some specimens all reduced to a single one, sometimes thrown a little to one side. Involucral bracts 2, subulate, one often ½ in. long erect or spreading, the other very short. Spikelets ovoid-oblong, 1 to 2 or rarely 2½ lines long. Glumes not numerous, often in 3 rows, obtuse or the prominent keel produced into a very short erect point, the sides rather broad, smooth or striate with very fine nerves, pale coloured, but frequently marked by a dark spot. No hypogynous bristles. Stamens usually 3. Style-branches 3. Nut ovoid, half as long as the glume or longer, prominently 3-angled, the terminal point minute or obsolete.—*Isolepis cartilaginea*, R. Br. Prod. 222; Nees in Pl. Preiss. ii. 73; Hook. f. Fl. Tasm. ii. 88. t. 145; *I. Bergiana*, Schult.; Kunth, Enum. ii. 194; *Scirpus Bergianus*, Spreng.; Bœckel. in Linnæa, xxxvi. 693; *Isolepis notata*, Nees in Pl. Preiss. ii. 74.

Victoria. Yarra River, *F. Mueller*; *Adamson*; Cobberas Mountains, *F. Mueller*; Wimmera and Murray Rivers, *Dallachy*.

Tasmania. Kent's group, Bass's Straits, *R Brown*; abundant in sandy and moist places, *J. D. Hooker*.

S. Australia. Bugle and Lofty Ranges, Gawlertown, Mount Torrens, *F. Mueller*.

W. Australia. King George's Sound to Swan River and Rottenest Island, *R. Brown*; *Drummond*, *n.* 917, 918, *Preiss*, *n.* 1738, 1741, 1742, 1743, 1751, 1752, *Oldfield* and others.

Var. *alpina*. Stems and leaves rather stouter. Glumes rather larger, pale-coloured.—*Isolepis alpina*, Hook. f. Fl. Tasm. ii. 86, t. 143, B., *Scirpus Gunnii*, Bœckel. in Linnæa, xxxvi. 493.—Alpine Bogs, Lake St. Clair, Arthurs Lakes, etc. in Tasmania, *Gunn* and others; also the same variety but not quite so marked, Snowy Mountains, Victoria, *F. Mueller*.

Var. *propinqua*. Spikelets frequently solitary. Glumes more obtuse, the keel less prominent. Nut rather shorter and broader.—*Isolepis propinqua*, Nees in Ann. Nat. Hist. ser. i. vi. 46, not of R. Br. To this belong Preiss's n. 1744, 1746 and several other West Australian specimens, and apparently also Sieber's specimens, Agrostotheca n. 20, which however may not be Australian.

Nees describes his *I. notata* as monandrous, but in Preiss's specimen's both 1751 and 1752, I have found 3 stamens or in one flower only 2.

Some specimens from Victoria, *F. Mueller*, in Herb. Kew., without the precise station, have usually more than 6 spikelets in the cluster and the points of the glumes longer and slightly recurved, but they appear to belong to this species.

The *S. Bergianus*, correctly identified with the *S. cartilagineus*, is also in South Africa and in New Zealand.

11. **S. squarrosus**, *Linn.; Bœckel. in Linnæa*, xxxvi. 734, var. *Dietrichiæ*.—Stems slender, tufted, 3 to 6 in. high or rarely more. Leaves shorter, setaceous. Spikelets 3 to 6 together in a terminal cluster. Involucral bracts usually 3, spreading, linear-subulate, one usually 1 to 2 in. long, the others much shorter. Spikelets ovoid-conical, 1½ to 2 lines long or at length rather elongated with the lower glumes very deciduous so as to appear pedicellate. Glumes very numerous, linear or somewhat cuneate, 3-nerved, tapering into a long recurved point. No hypogynous bristles. Stamens 1 or 2. Style short; branches 2 or 3. Nut in the Australian variety very narrow, almost linear, slightly compressed.—*Scirpus Dietrichiæ*, Bœckel. in Flora, 1875, 109 (from the char. given).

N. Australia. In the interior, lat 17° 50′, *M'Dougal Stuart's Expedition.*
Queensland. Rockhampton, *Amalia Dietrich*, if correctly identified.

The species (*Isolepis squarrosa*, Rœm. et Schult.; Kunth, Enum. ii. 202), extends over tropical Asia and Africa, but the nut is there usually broader and shorter than in our Australian specimens.

12. **S. inundatus**, *Spreng. Syst.* i. 207.—A very variable plant, sometimes with the dwarf slender habit of *S. cartilaginea*, sometimes elongated with the proliferous inflorescence of *S. prolifer*. Stems slender, often filiform, and when thicker much less so than in *S. prolifer*, from scarcely above 1 in. to near 1 ft. long, with usually a single short leaf, sometimes reduced to the sheath with a small point. Spikelets 3 to 6 or more together in a terminal cluster, the involucral bracts shorter or one more frequently subulate and longer than the cluster, rarely attaining ½ in. Spikelets ovate-oblong, rather acute, rarely above 2 lines long, usually brown. Glumes concave, ovate, obtuse or the scarcely prominent keel produced into a short point, the sides striate with dark streaks or slightly prominent nerves or quite smooth, rarely pale coloured throughout, and then often dotted. No hypogynous bristles. Stamens always 1 only and very frequently the filament persistent at the back of the nut. Style-branches 3; rarely 2. Nut rather broad, equally and prominently 3-angled or more or less flattened, smooth, the terminal point minute.—*Isolepis inundata* and *I. propinqua*, R. Br. Prod. 222; *I. prolifera*, Hook. f. Fl. Tasm. ii. 87, t. 144, not of R. Br.; *I. conspersa*, Nees in Endl. Prod. Pl. Norf. 23 ;

I. Gaudichaudiana, Kunth, Enum. ii. 201; *I. Urvillei* and *I. Gunnii*, Steud. Syn. Glum. ii. 94; *Scirpus conspersus* (partly), *S. Urvillei*, *S. costatus*, (partly) and *S. Gaudichaudii*, Bœckel. in Linnæa, xxxvi. 505, 510, 511.

Queensland. Brisbane River, Moreton Bay, *F. Mueller.*
N. S. Wales. Port Jackson to the Blue Mountains, *C. Moore*, *Woolls* and many others; New England, *C. Stuart*, *C. Moore;* Richmond River, *Fawcett;* Hastings River, *C. Moore.*
Victoria. Yarra River, *F. Mueller;* Dandenong Ranges, *Lachmann;* Red Jacket Creek, *Gargurevich.*
Tasmania. Abundant in wet places, sometimes also under water or in dry places. *J. D. Hooker.*
S. Australia. Bethanie and Lofty Ranges, *F. Mueller.*

Var. *floribundus.* Stems densely tufted, scarcely exceeding 2 in. Spikelets 10 to 16 or even more, in dense heads of 3 to 3½ lines diameter, one bract sometimes 1 in. long and rigid.—Upper Loddon River, *F. Mueller.*

The species is also in New Zealand and in Norfolk Island. The various forms it assumes have been well alluded to by Hooker, l. c., but in the large number of specimens now before me I am unable to sort them into distinct varieties, as most of the diversities in form are individual rather than genetic. Brown's *I. propinqua*, represents the prevailing state; his *I. inundata* is exactly like it, except that the style is exceptionally 2-merous. *I. conspersa*, Nees, is a not uncommon state rather larger than usual, but the Tristan d'Acunha plant included in it by Bœckeler is the *I. sulcata*, Carmich. with 3-androus flowers besides a more rigid habit. looser leaf-sheaths, etc. *I. conspersa*, Nees is said by him to be 3-androus probably through inadvertence. I find only one stamen in Bauer's specimens, as in all those I have examined of the numerous forms of *S. inundatus.*

13. **S. prolifer,** *Rottb. Descr. et Ic. Pl.* 55, *t.* 17, *f.* 2.—Stems tufted or shortly creeping at the base, from a few inches to above 1 ft. long, weak but much thicker than in *S. inundatus*, leafless except a sheathing scale oblique at the orifice. Spikelets several, often many, in a terminal cluster or head which is often proliferous emitting 1 or more short branches of ½ to 2 in. terminating in a small cluster of spikelets. Involucral bracts short and glume-like, concealed under the cluster. Spikelets oblong, 2 to 4 lines long, pale coloured. Glumes ovate, obtuse, scarcely striate, but marked with longitudinal brown lines. No hypogynous bristles. Stamens usually if not always 3. Style-branches 3. Nut short, prominently 3-angled, smooth or minutely granular, the terminal point very small.—Bœckel. in Linnæa, xxxvi. 692; *Isolepis prolifera*, R. Br. Prod. 223; Kunth, Enum. ii. 201.

N. S. Wales. Port Jackson, *R. Brown*, *Sieber*, *Agrostoth. n.* 21, *J. D. Hooker* *C. Moore*, *Woolls;* New England, *C. Stuart.* A South African species which R. Brown thinks may have been introduced into N. S. Wales.

14. **S. supinus,** *Linn.; Bœckel. in Linnæa*, xxxvi. 699, *excl. var β and γ.*—Stems tufted, decumbent or erect, striate, from 2 or 3 in. to above 1 ft. long, leafless except a rather long sheathing scale often produced into a short narrow lamina. Spikelets 2 to 6 together in a lateral cluster, the outer involucral bract erect and continuous with the

stem often 2 in. long and only slightly dilated at the base. Spikelets oblong, 2 to 4 lines long. Glumes prominently keeled, acute or the keel produced into a conspicuous point, loosely imbricated and generally very deciduous. Hypogynous bristles none or very short and few. Stamens 2 or 3. Style-branches 3. Nut broad, prominently 3-angled, or rarely biconvex, prominently marked with transverse wrinkles.—Reichb. Ic. Fl. Germ. t. 302: *Isolepis supina*, R. Br. Prod. 221; Kunth, Enum. ii. 196; F. Muell. Fragm. ix. 6.

Queensland. Keppel Bay, *R. Brown*, Brisbane River, *Bailey.*
N. S. Wales. Nepean River, *R. Brown.*
Victoria. Lake Lalbert, *F. Mueller.*

Widely spread over the tropical and temperate regions of the Old World, more rare in the southern states of North America.

15. **S. articulatus,** *Linn.; Bœckel. in Linnæa,* xxxvi. 702.—Stems terete, hollow, more or less distinctly septate inside so as to appear articulate, 2 or 3 in. to 2 ft. high. Spikelets numerous in a dense lateral cluster, the involucral bract erect and continuous with the stem, precisely like it and often as long as or longer than the true stem. Spikelets ovoid or oblong, 3 to 6 lines long, 2 lines diameter at the base or rather more, pale brown. Glumes broad, rather acute or mucronate, slightly striate, the keel scarcely prominent. Hypogynous bristles none or rarely few and minute. Stamens 3. Style-branches 3. Nut prominently and acutely 3-angled.—*Isolepis articulata,* Nees; Kunth, Enum. ii. 198; *I. prælongata,* Nees; Kunth, l. c. 199; F. Muell. Fragm. ix. 6.

N. Australia. Mouth of Victoria River, *F. Mueller.*
Queensland. Near Rockhampton, *Thozet.*

Common in tropical Asia and Africa.

16. **S. nodosus,** *Rottb. Descr. et Ic. Pl. 52, t. 8, f. 3.*—Rhizome creeping. Stems rigid, rush-like, terete or slightly flattened, 1 to 3 ft. high, leafless except the sheathing scales at the base. Spikelets small and numerous, in a dense globular lateral head varying from 3 to 9 lines diameter, the rigid erect involucral bract continuing the stem ½ to 1½ in. long. Spikelets ovoid, 2 to 3 lines long in the ordinary form, about 2 lines diameter, of a dark brown. Glumes broadly ovate, obtuse or scarcely mucronate, their base rather rigid almost scarious, nerveless or finely nerved, the keel scarcely prominent. No hypogynous bristles, but the torus slightly produced within the stamens into a minutely 3-toothed disk approaching that of *Ficinia.* Style-branches 3. Nut short, broad, smooth and shining, the inner face flat, the back more or less distinctly angled.—Bœckel. in Linnæa, xxxvi. 718; *Isolepis nodosa*, R. Br. Prod. 221; Kunth, Enum. ii. 199; Nees in Pl. Preiss. ii. 73; Hook. f. Fl. Tasm. ii. 87; Rich, Fl. Nov. Zel. t. 18; F. Muell. Fragm. ix. 6.

N. S. Wales. Port Jackson, *R. Brown*, *Sieber*, *Agrostotheca*, *n.* 29, and others; Richmond River, *Mrs. Hodgkinson*; Clarence River, *Wilcox*; Tweed River, *Guilfoyle*; Lord Howe's Island, *Fullagar*.

Victoria. Port Philip, *Gunn*, *Adamson*; Portland and Emu Creek, *Robertson*.

Tasmania. *R. Brown*; common on the sand hills of the northern shore, *J. D. Hooker*.

S. Australia. Port Lincoln, *R. Brown*; Encounter Bay, *Wilhelmi*; St. Vincent's Gulf, *F. Mueller*.

W. Australia. King George's Sound, *R. Brown*, *F. Mueller*; Swan River, *Drummond*, *1st coll. also n.* 384, *Preiss*, *n.* 1870; Gordon and Murchison Rivers, *Oldfield*.

Var. *macrostachya*. Spikelets at length 4 or 5 lines long. Glumes acute or mucronate.—Murchison River, *Oldfield*; Buffalo, *Pries*.

The species is also in New Zealand, South Africa, and extratropical South America.

SECTION II. EUSCIRPUS.—Hypogynous bristles 3 to 8, very rarely deficient in some individuals.

The first three species have nearly the habit of the last two or three of the section *Isolepis*, the others are all tall and stout. The *S. acicularis*, with the habit of the small slender species of *Heleocharis* or *Fimbristylis*, but with the characters of *Euscirpus*, so common in the temperate regions of the northern hemisphere, has not yet been found in Australia.

17. **S. debilis**, *Pursh*; *Kunth*, *Enum.* ii. 159.—Very nearly allied to *S. supinus*, and referred to it as a variety by Bœckeler, but differs in the glumes and nuts as well as in the bristles. Stems often 1 foot high or more, erect, less rigid than in the following species but more so than in *S. supinus*. Spikelets lateral, in close clusters of 2 or 3 or solitary, the erect involucral bract continuing the stem. Spikelets ovoid or ovoid-oblong, 3 to 5 lines long, 2 to 3 lines diameter. Glumes numerous, closely imbricate, not at all or scarcely deciduous, broad almost orbicular, concave, keeled only at the summit, obtuse or minutely pointed. Hypogynous bristles 4 to 6, longer or shorter than the nut, rarely wanting in an American variety. Stamens 2. Style-branches 2. Nut much flattened, minutely rugose or dotted in Indian and American specimens, almost muricate in the Australian ones examined.—*S. juncoides*, Roxb.; Kunth, Enum. ii. 160; *S. supinus*, *var. β. and γ.* Bœckel. in Linnæa, xxxvi. 700, 701.

N. Australia. Upper Victoria River and Sturt's Creek, *F. Mueller*.

Queensland. Gainsford, *Bowman*.

Also in East India and North America.

18. **S. mucronatus**, *Linn.*; *Kunth*, *Enum.* ii. 161.—Stems tufted, stout, very acutely 3-angled, 1 to 3 ft. high, leafless except the sheathing scales at the base, the innermost ones sometimes produced into a short point. Spikelets rather numerous, in a dense lateral sessile cluster; the erect involucral bract perfectly continuous with the stem and 1 to 2 in. long. Spikelets ovoid-oblong, 4 to 6 lines long, 2 to 3 lines diameter, pale brown. Glumes ovate, concave, obtuse or almost acute, membranous, more or less striate, the keel prominent and often

green in the upper part. Hypogynous bristles 6 or fewer, usually longer than the nut. Style-branches 3. Nut rather small, generally dark coloured, the broad inner face flat, the back convex or angled.—R. Br. Prod. 223; Reichb. Ic. Fl. Germ. 303; Bœckel. in Linnæa, xxxvi. 703; F. Muell. Fragm. ix. 8.

Queensland. Brisbane River, Moreton Bay, *F. Mueller*, *C. Stuart*, *Bailey;* Daintree River, *Fitzalan;* Burnett River, *F. Mueller;* Rockingham Bay, *Dallachy.*

N. S. Wales. Paterson River, *R. Brown;* Clarence River, *Beckler*, *Wilcox;* Tweed River, *Robinson;* Richmond River, *Woolls.*

Also in tropical and temperate Asia and in Europe.

19. **S. pungens,** *Vahl; Kunth, Enum.* ii. 162.—Rhizome creeping. Stems usually stout, 1 to 3 ft. high, acutely 3-angled. Leaves few and sometimes only 1 with a very long sheath, the lamina shorter or rarely longer than the stem. Spikelets in a lateral cluster of 3 to 6 or rarely more or reduced to a single one, the angular or flattened erect involucral bract continuing the stem and 1 to 3 in. long. Spikelets ovoid or oblong, dark brown, 3 to 4 lines or rarely ½ in. long, 2 to 3 lines diameter. Glumes membranous, broad, entire emarginate or 2-lobed, the keel usually prominent in the upper part only and produced into a very short or rather long point, the sides nerveless. Hypogynous bristles 6 or fewer, usually shorter than the nut and sometimes wanting. Style-branches 3. Nut rather broad, pale coloured, the inner face flat, the back convex or with a prominent angle.—Bœckel. in Linnæa, xxxvi. 708; Reichb. Ic. Fl. Germ. x. 304; F. Muell. Fragm. ix. 8; *S. triqueter*, R. Br. Prod. 223; Hook. f. Fl. Tasm. ii. 89, not of Linn.

Victoria. Near Mount Emu, Lake Colac, Hopkins River, etc.; *F. Mueller;* mouth of the Glenelg, *Allitt.*

Tasmania. Derwent River, *R. Brown;* near Hobarton, *Gunn;* Macquarrie Harbour, *Milligan.*

S. Australia. Torrens River and Crystal Brook, *F. Mueller;* Port Lincoln, *S. R. Browne.*

W. Australia. *Drummond, 4th coll. n.* 359.

Var. *nanus.* Stems 2 to 3 in. high. Leaves almost radical. Spikelets small and solitary.—Lake Colac, *F. Mueller.* Perhaps rather a starved state than a variety.

Var.? *longisetis.* Bristles much longer than the nut.—Lake Eyre, South Australia, *Andrews.* The spikelets appear to be several imbricate in a compound cylindrical spike of ¾ in., but the single specimen insufficient for accurate determination.

The species is also in New Zealand, in extra-tropical North and South America, and of the western Mediterranean region.

20. **S. lacustris,** *Linn.; Kunth, Enum.* ii. 164.—Stems stout, 2 to 5 ft. high, terete or obtusely triquetrous at the apex, leafless except a long loose sheathing scale sometimes continued into a short erect lamina. Spikelets numerous in an irregularly compound umbel appearing lateral, but the erect involucral bract continuing the stem usually much shorter than the inflorescence, nearly terete, channelled on the

inner side and dilated at the base. Spikelets ovoid and about 4 lines long or at length oblong-cylindrical and ½ in. long, brown coloured. Glumes numerous, scarious, usually very broad, scarcely keeled except at the end, very obtuse and often emarginate, with or without a short point in the notch. Hypogynous bristles 6 or fewer, minutely ciliate with reversed hairs as in the majority of the section, mostly shorter than the nut. Stamens 3. Style-branches 2. Nut broad, much flattened, tipped with a small point or tubercle.—Bœckel. in Linnæa, xxxvi. 712; R. Br. Prod. 223; Reichb. Ic. Fl. Germ. x. 306; F. Muell. Fragm. ix. 7; *S. Meyenii*, Nees in Pl. Preiss. ii. 75.

Queensland. Port Denison, *Fitzalan;* Barcoo Downs, *Birch;* Rockhampton, *Thozet.*

N. S. Wales. Port Jackson and Hunter's River, *R. Brown;* New England, *C. Stuart;* Richmond River, *Woolls.*

Victoria. Wannen River, *Robertson;* Port Phillip, *Gunn;* Yarra, *F. Mueller;* Skipton, *Whan.*

Tasmania. Derwent River, *F. Mueller.*

S. Australia. Port Adelaide, *F. Mueller.*

W. Australia. Swan River, *Preiss, n.* 1872; Murchison River, *Oldfield.*

Extends over both the New and the Old World, chiefly in extra-tropical regions.

21. **S. littoralis,** *Schrad.; Kunth, Enum.* ii. 166.—A tall stout species, with the habit and inflorescence of *S. lacustris.* Stems terete or 3-angled towards the apex, 2 to 5 ft. high, leafless except the sheathing scales at the base often ending in short erect laminæ. Umbel looser and less compound than in *S. lacustris*, with fewer spikelets, the erect involucral bract continuing the stem short or as long as the inflorescence, channelled along the inner side or more distinctly triquetrous. Spikelets oblong or cylindrical, often above ½ in. long when full grown and about 2 lines diameter. Glumes broad, scarious, often pale coloured, entire or slightly emarginate. Hypogynous bristles or scales 4 or rarely 5 or 6, much flattened, plumose with soft rather long hairs directed upwards. Stamens usually 3. Style-branches 2. Nut broad, much flattened, tipped by a small point or tubercle.—Reichb. Ic. Fl. Germ. 309; F. Muell. Fragm. ix. 7; *S. plumosus*, R. Br. Prod. 223; *S. triqueter*, Gren. et Godr. Fl. Fr. iii. 373; Bœckel. in Linnæa, xxxvi. 716, not of Linn.; *Malacochæte littoralis*, Nees.

N. Australia. Gulf of Carpentaria, *R. Brown, F. Mueller;* Victoria River, *F. Mueller;* Roper River, *Gulliver.*

Queensland. Broad Sound, *R. Brown;* Brisbane River, Moreton Bay, *C. Stuart, Henne.*

N. S. Wales. Paramatta, *Woolls.*

Also in the Mediterranean region, at least I am unable to detect any difference in the specimens from the two distant areas. Grenier and Godron, misled by their interpretation of the Linnean character, referred this to his *S. triqueter*, which, however, as well by the specimen in his herbarium as by the figure of Plukenet's to which he refers, proves to have been correctly identified by Kunth and others with the plant described by Grenier and Godron under the name of *S. Pollichii*, the essential character distinguishing the two species derived from the hypogynous bristles or scales was overlooked both by Linnæus and by Schrader.

22. **S. maritimus**, *Linn.; Kunth, Enum.* ii. 167.—Rhizome creeping, often thickened into hard tubers. Stems 1 to 3 ft. high, triquetrous, smooth or slightly scabrous. Leaves often longer. Spikelets solitary or 3 together on each peduncle, forming sometimes a terminal irregular umbel of few unequal rays, sometimes contracted into a sessile cluster. Involucral bracts few, the lowest long leafy and erect, apparently continuing the stem, the others short or 1 or 2 of them long and leaflike. Spikelets in the Australian varieties ovoid or ovoid-oblong, 6 to 9 lines long, 3 to 4 lines diameter. Glumes broad, brown and scarious, the midrib or keel 1- or 3-nerved and produced into an erect or recurved point or awn, the broad scarious nerveless sides jagged at the end or forming 2 lobes shorter than the awn. Hypogynous bristles 6 or fewer, mostly shorter than the nut. Stamens 2 or 3. Style-branches 3 or rarely 2. Nut in the typical form broad, usually black when ripe, the inner face flat or nearly so, the back convex or obtusely angled.—Bœckel. in Linnæa, xxxvi. 722; R. Br. Prod. 224; Hook. f. Fl. Tasm. ii. 89; F. Muell. Fragm. ix. 8; Reichb. Ic. Fl. Germ. t. 310, 311.

Queensland. East coast, *R. Brown;* Port Molle, *M'Gillivray*; King's Creek, *Bowman;* Condamine River, *Leichhardt;* Brisbane River, Moreton Bay, *C. Stuart.*

N. S. Wales. Port Jackson, *R. Brown;* Paramatta and Richmond, *Woolls;* Clarence River, *Wilcox.*

Victoria. Yarra River, *Adamson, F. Mueller,* Lake Colac, *F. Mueller.*

Tasmania. Abundant in salt and brackish marshes, *J. D. Hooker.*

S. Australia. Bethanie, *F. Mueller.*

W. Australia. Swan River, *Drummond, n.* 936; Murchison River, *Oldfield;* Busselton, *Pries.*

Var. *fluviatilis.* Stem 3 to 5 ft. high, acutely 3-angled. Involucre and inflorescence more developed than in the typical form. Nut equally triquetrous.—*S. fluviatilis,* A. Gray; F. Muell. Fragm. ix. 8. To this variety belong most of the Queensland and N. S. Wales specimens, amongst others Brown's, from Port Jackson, which he distinguishes as var. β from his typical Queensland specimens. Some from the lower Yarra are remarkable for the very tall stout acute-angled stems and the number of the long leafy involucral bracts. These specimens have all triquetrous narrow but rather small nuts; the N. American have the nuts very much larger and white. Some of Robertson's Victoria specimens are said to be 5 ft. high, but the stems less stout and the nuts variable, usually as it were intermediate between the two common forms. The species extends over the tropical and temperate regions both of the New and the Old World.

23. **S. polystachyus,** *F. Muell. in Trans. Phil. Soc. Vict.* i. 108, *and in Hook. Kew Journ.* viii. 333; *Fragm.* ix. 9.—Stems 2 to 4 ft. high, more or less triquetrous. Leaves several along the stem with long sheaths, the lamina often 3 or 4 lines broad at the base, the uppermost as long as or longer than the stem. Umbel large loose and compound, of numerous rather slender rays, the longest 3 or 4 in. long. Spikelets clustered on the partial rays or distinctly but shortly pedicellate, ovate-oblong, 3 to 4 lines long, and 1½ to near 2 lines diameter. Glumes oblong or ovate, obtuse, the keel and sometimes 1 nerve on each side prominent. Hypogynous bristles about 6, very slender and flexuose, 2 or 3 times as long as the nut. Style-branches 3. Nut broad, the inner face flat, the back convex or obtusely angled.

N. S. Wales. Clarence River, *Wilcox;* Mount Mitchell, *Beckler.*
Victoria. Lake Omeo, Hume, Mitta Mitta and Snowy Rivers, *F. Mueller.*

This species has the peculiar hypogynous bristles and something of the habit of the European *S. radicans*, Schkuhr, but appears to be quite distinct in the larger more clustered spikelets and some other characters.

6. LIPOCARPHA, R. Br.

Spikelets in a terminal cluster or head, with numerous hermaphrodite flowers. Glumes imbricate all round the rhachis, the lowest 1 or rarely 2 empty. Hypogynous scales 2, parallel to the glume, as long as or longer than the nut and enclosing it. Stamens 1 or 2 (rarely 3 ?). Style deciduous, slender, with 2 or 3 stigmatic branches. Nut oblong, somewhat compressed, obtuse or crowned by a very small persistent base of the style.—Annuals or perennials, the stems leafy at the base only. Spikelets few, small, sessile. Involucral bracts leaflike narrow unequal, spreading.

A small genus spread over the tropical regions of the New and the Old World. Both the Australian species are also in the Malayan Archipelago, and one of them has a very wide tropical range.

In the Flora Hongkongensis, misled by the approximation of the genus by some botanists to *Kyllinga* and by others to *Hypolytrum*, I described the flowers as 1-flowered spikelets, enclosed in heads resembling spikelets, but a closer examination convinces me that it is really very close to *Scirpus* (*Isolepis*), and connects that genus with *Fuirena*. The two hypogynous scales are never lateral and carinate like the outer scales or bracteoles of *Hypolytrum*, but appear to correspond in every respect with the scales of *Fuirena*, *Hemicarpha*, and of *Scirpus littoralis*, differing in number, usually 1 in *Hemicarpha*, 2 in *Lipocarpha*, 3 in *Fuirena*, und 4 in *Scirpus littoralis.*

Usually perennial, often above 1 ft., with linear leaves.
  Glumes spathulate or broadly cuneate, scarcely pointed. 1. *L. argentea.*
Annual, under 6 in., with filiform leaves. Glumes narrow,
  with spreading points . . . . 2. *L. microcephala.*

1. **L. argentea,** *R. Br. App. Tuck. Congo*, 40.—Stems from a perennial rhizome attaining 1 to 1½ ft. Leaves much shorter, flat, 1 to 1½ lines broad, with short open sheaths, or the inner one with a long closed sheath and short lamina. Spikelets 3 to 5, in a dense terminal head. Involucral bracts 3 or 4, spreading, the longest often 3 or 4 in. long, the others much shorter. Spikelets at first nearly globular, at length ovoid or ovoid-conical, nearly white, 3 or rarely 4 lines long. Glumes very numerous, closely imbricate, spathulate or obovate-cuneate, thin and almost hyaline, rounded at the end but the broad central nerve often produced into a short point. Hypogynous hyaline scales oblong. Stamen 1. Style-branches 3. Nut oblong, much flattened, obtuse, smooth.—Kunth, Enum. ii. 266; Bœckel. in Linnæa, xxxvii. 114; *Hypælyptum argenteum*, Vahl; F. Muell. Fragm. viii. 238.

Queensland. Brisbane River, *Bailey.* Widely spread over the tropical regions of the Old World, and perhaps in America also, although the Columbian specimens I have seen do not quite agree with the Asiatic ones. As it is only known in Australia from this one gathering it may be doubtful whether it may not have been introduced.

Vahl's name, *Hypælyptum*, was a mistake for *Hypolytrum*, as pointed out by Brown, l. c., Vahl having intended to include this species in Richard's genus of that name.

2. **L. microcephala,** *Kunth, Enum.* ii. 268.—A tufted annual, the very slender stems usually from 1 or 2 to 6 in., but sometimes nearly 1 ft. high. Leaves shorter, very narrow, with rather broad striate sheaths. Spikelets usually 3, but varying from 1 to 5 or very rarely more. Involucral bracts very narrow, the longest 1 to 2 in. long. Spikelets ovoid-conical, 1½ to 2 lines long. Glumes very numerous, narrow, slightly cuneate, acuminate, the green keel produced into a short usually spreading point. Hypogynous hyaline scales narrow. Stamens 1 or 2. Style-branches 2. Nut oblong-linear, compressed, rather acute or almost obtuse, rather shorter than the hypogynous scales.—Bœckel. in Linnæa, xxxvii. 118; *Hypælyptum microcephalum,* R. Br. Prod. 220; F. Muell. Fragm. viii. 238; *Scirpus leptocarpus.* F. Muell. in Trans. Phil. Soc. Vict. i. 109, and in Hook. Kew Journ. viii. 334.

N. Australia, Arnhem S. Bay, *R. Brown;* between Norman and Gilbert Rivers, *Gulliver;* Port Darwin, *Schultz, n.* 78.

Queensland. Rockingham Bay, *Dallachy;* Herbert Creek, *Bowman;* Dry-beef Creek, *Leichhardt;* Rockhampton, *O'Shanesy.*

Victoria. Murray, Ovens, and King's Rivers, *F. Mueller.*

7. FUIRENA, Linn.

Spikelets clustered, with several usually many hermaphrodite flowers. Glumes imbricate all round the rhachis, the lowest 1 or rarely 2 empty. Hypogynous scales 3, broad, usually 3-nerved, often alternating with small bristles. Stamens 3; anthers small. Style deciduous, with 3 stigmatic branches. Nut 3-angled.—Perennials or annuals with leafy stems. Leaf-sheaths crowned with an annular membrane. Clusters of spikelets terminal and in the upper axils, usually forming an irregular narrow terminal panicle or the clusters few and distant. Spikelets usually pubescent or hirsute.

The genus consists of but few species dispersed over the warmer regions of the New as well as the Old World, the Australian ones having both a general distribution over nearly the whole area.

Leaves glabrous. Glumes shortly pointed. Hypogynous scales contracted at the base but sessile or nearly so, without bristles . . . . 1. *F. umbellata.*

Leaves pubescent or at least ciliate. Glume-points long, often recurved. Hypogynous scales cordate at the base, stipitate, usually alternating with bristles . . . . 2. *F. glomerata.*

1. **F. umbellata,** *Rottb. Descr. et. Ic. Pl.* 70, *t.* 19, *f.* 3.—Perennial. Stems 1½ to 3 ft. long, 4- or 5-angled, glabrous. Leaves glabrous, the larger ones 4 to 6 in. long, 4 to 5 lines broad, the lowest with long

sheaths and short laminæ, the upper ones passing into small floral leaves or sheathing bracts. Spikelets brown-green, usually 3 to 4 lines long, sparingly hirsute, in very dense clusters, of which 1 or 2 terminal, the others 1 or 2 together pedunculate in the upper axils. Glumes ovate, very prominently 3-nerved, produced into an erect or slightly recurved point, much shorter than in *F. glomerata.* Hypogynous scales brown, obovate, nearly ½ line long, truncate and mucronate at the top, contracted at the base but nearly sessile without any intervening bristles. Nut rather broad, acutely triquetrous, mucronate with the slightly thickened persistent base of the style.—Kunth, Enum. ii. 185 ; Bœckel. in Linnæa, xxxvii. 110 ; R. Br. Prod. 220 ; F. Muell. Fragm. viii. 238.

N. Australia. Providence Hill and sources of the Limmen-Bight River, F. *Mueller.*

Queensland. Endeavour River, *Banks and Solander ;* Port Curtis, *M'Gillivray ;* Rockingham Bay, *Dallachy ;* Rockhampton, *Bowman.*

2. **F. glomerata,** *Lam. ; Kunth, Enum.* ii. 184.—Apparently annual. Stem weak, rarely above 1 ft. high. Leaves more or less pubescent or at least ciliate on the edges. Spikelets rather larger than in *F. umbellata,* either in a single terminal cluster with a leafy bract at the base, or more frequently with the addition of 1 or 2 almost sessile clusters in the upper axils. Glumes obovate, 3-nerved, produced into a rather long usually spreading or recurved point. Hypogynous scales very variable, but always distinctly stipitate and more or less cordate, usually truncate at the top and sometimes with a long terminal seta, white and thickened towards the apex or brown and membranous throughout, alternating with bristles sometimes as long as themselves, sometimes very short. Style-branches occasionally 2 only but usually 3. Nut obovoid, acutely 3-angled.—Bœckel. in Linnæa, xxxvii. 107 ; R. Br. Prod. 220 ; F. Muell. Fragm. viii. 238 ; *Scirpus ciliaris,* Linn. ; Rottb. Descr. et Ic. Pl. t. 17. f. 1 ; *F. arenosa,* R. Br. Prod. 220.

N. Australia. Upper Victoria River and Providence Hill, *F. Mueller ;* Port Darwin, *Schultz, n.* 256 *and* 282 (the latter a long very slender starved state) ; between Norman and Gilbert Rivers, *Gulliver.*

Queensland. Endeavour River, *Banks and Solander, A. Cunningham ;* Keppel Bay, *R. Brown ;* Cape York, *Daemel ;* Rockingham Bay, *Dallachy ;* Rockhampton and neighbourhood, *Thozet, Bowman* and others ; Brisbane River, Moreton Bay, *F. Mueller, Bailey ;* Dry-beef Creek, *Leichhardt.* Brown's *F. arenosa* was founded upon old weak specimens from Point Lookout, *Banks and Solander,* from which the flowers and glumes have mostly fallen away.

TRIBE II. HYPOLYTREÆ.—Spikelets solitary clustered or paniculate, with several usually numerous flowers ; all hermaphrodite or some male only. Glumes imbricate all round, several of the lowest empty. Flowers within the glumes flat, with 2 complicate keeled hypogynous scales (or bracteoles ?), and often flat linear scales within them.

8. HYPOLYTRUM, Rich.

Spikelets numerous, in a corymbose panicle rarely contracted into a dense cluster, with several often numerous hermaphrodite flowers. Glumes imbricate all round the rhachis, several of the lower ones smaller and empty. Flowers flat. Hypogynous scales (bracteoles?) 2, placed right and left, complicate, the keel acute usually ciliate, no inner flat ones. Stamens 3 or fewer. Style slender, deciduous; stigmatic branches 2 or 3, filiform. Nut hard, obtusely 3-angled or compressed, smooth or irregularly wrinkled.—Usually coarse perennial plants with leafy stems. Panicles compound, with long leafy involucral bracts. Spikelets small.

The genus comprises but few species dispersed over the tropical and subtropical regions of the New and the Old World, the Australian species having a very wide general range.

1. **H. latifolium,** *Rich.; Kunth, Enum.* ii. 271.—Stems acutely 3-angled, 2 to 4 ft. high. Leaves usually longer, ½ to 1 in. broad, with 3 prominent nerves and more or less scabrous on the margins and midrib. Panicle densely corymbose, 3 to 4 in. diameter, with 2 to 4 long leafy involucral bracts. Spikelets very numerous, oblong-cylindrical at first, ovoid when in fruit, 2 to 3 lines long. Glumes numerous, broadly ovate, obtuse or scarcely mucronate, the midrib slightly prominent, otherwise nerveless, 3 or 4 of the lower ones empty and more acute. Hypogynous scales or bracteoles prominently keeled when in flower, opened out and nearly flat under the fruit, shorter than the glume. Stamens 2. Style-branches 2 (or 3?). Nut when fully ripe nearly globular, slightly compressed, rather longer than the glume, very obtuse and smooth, in some specimens narrower conical at the top and somewhat rugose but perhaps not ripe.—F. Muell. Fragm. viii. 238; *H. giganteum*, Wall.; Bot. Mag, t. 6282; Bœckel. in Linnæa, xxxvii. 131.

Queensland. Rockingham Bay, *Dallachy;* Daintree River, *Fitzalan.* Common in tropical Asia and Africa, and closely allied to if not identical with an American species.

9. EXOCARYA, Benth.

Spikelets small, umbellate-paniculate, with 1 or 2 hermaphrodite flowers and 2 or 3 male ones below them. Glumes imbricate all round, several lower ones empty. Flowers flattened. Hypogynous scales 4, 2 outer ones (bracteoles?) placed right and left, complicate, keeled, 2 inner flat or concave, parallel with the glume. Stamens 3. Style dilated at the base into a hard bulb, with 2 linear stigmatic branches. Nut exserted, crowned by the persistent bulb of the style.—Stem leafy. Umbel compound, the general and partial rays slender with a central sessile spikelet as in *Fimbristylis.*

The genus is limited to the single species, endemic in Australia.

1. **E. scleroides,** *Benth. in Hook. Ic. Pl. t.* 1206.—Stems from a creeping rhizome 2 ft. high or more but slender and weak, 3-angled,

leafy throughout. Leaves grass-like, long and flat, 1 to 2 lines broad, tapering into long subulate points, the sheaths close. Umbel large and slender, very compound, the longest rays 4 to 6 in. long, filiform as well as the pedicels. Involucral bracts several, like the leaves, but the longest scarcely so long as the inflorescence. Spikelets 1 to 1½ lines long, narrow-oblong, dark brown. About 6 empty glumes all obtuse, the outer ones very short, the inner gradually passing into the longer flowering ones. Male flowers usually about 3, and 1 rarely 2 hermaphrodite flowers in the spikelets examined. Hypogynous scales as long as the glume, the 2 outer complicate ones with shortly ciliate keels, the 2 inner ones parallel to the glume and flat or concave. Stamens 3. Style-bulb black, larger than the ovary at the time of flowering but not enlarged afterwards. Nut quite exserted, erect, ovoid-oblong, very obtuse, about 2 lines long and 1½ lines diameter, smooth but not shining, the remains of the spikelet forming a small tuft at its base.—*Cladium scleroides*, F. Muell. Fragm. ix. 12.

Queensland. Araucaria Forests on the Dawson and Burnett Rivers, *Leichhardt.*
N. S. Wales. Richmond and Clarence Rivers, *Wilcox;* Richmond River and Liverpool Plains, *C. Moore.*

In technical characters this elegant plant approaches very nearly to *Mapania*, and is as it were intermediate between that genus and *Hypolytrum*, but the inflorescence, the minute spikelets and the exserted nuts larger than the whole spikelet give it a very different aspect from any species of either genus.

10. MAPANIA, Aubl.

(Pandanophyllum, *Hassk.* Thoracostachyum, *Kurz.*)

Spikelets solitary clustered or paniculate, with numerous hermaphrodite flowers. Glumes imbricate all round the rhachis, a few of the lowest empty. Flowers flattened. Hypogynous scales 6 (or in species not Australian more?), 2 outer ones (bracteoles?) placed right and left, complicate, the keel acute, usually ciliate; 4 inner ones flat or concave, narrow, thin, often several-nerved but without any prominent midrib, one next the glume, the 3 others alternating with the stamens. Stamens usually 3; 2 lateral and 1 next the glume. Style slender, glabrous, deciduous; stigmatic-branches 3, filiform. Nut sessile, triquetrous or flattened.—Stout perennial plants usually with long broad leaves. Stems leafless or leafy at the base only, sometimes scape-like with a single large spikelet or head of spikelets and small involucral bracts, sometimes with a terminal head corymb or panicle of few or numerous spikelets and long or large leafy involucral bracts. Spikelets usually large.

The genus is now known to contain a considerable number of species from the tropical regions of America, Africa and Asia, extending to the South Pacific Islands. The only Australian one is endemic, approaching one from the Malayan Archipelago, but with the inflorescence much more developed than in any extra-Australian species. The spikelet is generally described as a spike, the flowers as androgynous spikelets with 3 male flowers with single glumes and stamens, 3 empty glumes and a central female flower without any glume. The view however above given appears to be more in harmony with the known structure of the Cyperaceæ such as *Scirpus* and *Hypolytrum.* The spikelet as a whole is very much like that of the larger species of *Scirpus*, the two outer navicular scales within the glumes are evidently homologous to those of *Hypolytrum*, and the four inner ones to the scale-like bristles of *Scirpus littoralis.* In some extra-Australian species there appears to be an increase in the number of scales and perhaps of stamens, but so also is there an increase in the number of bristles in some species of *Scirpus.* Many of the larger species of *Mapania* require much farther examination and it is very rarely that herbarium specimens are available for the purpose.

1. **M. hypolytroides,** *F. Muell.*—Stems stout, 3-angled. Leaves '4 ft. long,' 1 to 2 in. broad, with scabrous edges. Panicle dense, very compound, 6 to 10 in. diameter. One or two of the lower involucral bracts 1 to 2 ft. long and ½ to 1 in. broad, tapering into long points. Spikelets very numerous, shortly pedicellate, said to be white when fresh, light brown when dry, ovoid, 3 to 4 lines long, about 2 lines diameter. Glumes closely imbricate, ovate or oblong, obtuse, thin, with only a very slender central nerve especially on the outer ones, 3 or 4 of the lowest smaller and empty. Hypogynous scales all narrow, thin and rather shorter than the glume, the two outer ones (or bracteoles) with ciliate keels, the four inner ones glabrous. Style-branches 3. Young nut triquetrous, but not seen full grown.—*Hypolytrum pandanophyllum*, F. Muell. Fragm. ix. 16.

Queensland. Rockingham Bay, *Dallachy.* The nearest approach to this species is the *M. sumatrana* (*Thoracostachyum*, Kurz in Journ. Asiat. Soc. Beng. xxxviii. 75; *Lepironia sumatrana*, Miq. Ill. Fl. Archip. Ind. 62. t. 24), which however has a much more slender stem, narrow leaves, a small corymbose panicle, and glumes of a different texture.

11. SCIRPODENDRON, Kurz.

Spikelets in dense clusters, with numerous hermaphrodite flowers. Glumes imbricate all round the axis, a few of the lower ones empty. Flowers flattened. Hypogynous scales several, 2 outer ones (bracteoles ?) placed right and left, complicate, the keel acute, usually ciliate, the inner ones flat or concave without any prominent midrib. Stamens 6 (or more ?). Style slender, glabrous, with 3 or 2 short filiform branches. Nut large, woody, with very prominent longitudinal ribs.—Stout plant with long broad leaves. Stems leafless or leafy at the base only. Clusters of spikelets in a dense thyrsoid panicle, with long leafy involucral bracts.

The genus is limited to a single species dispersed over the Malayan Archipelago and apparently also in Ceylon and the Samoa Islands. It is closely allied to *Mapania* and *Lepironia*, differing from both in the nut, the largest known in the order.

1. **S. costatum,** *Kurz in Journ. Asiat. Soc. Beng.* xxxviii. 85.—Stems from a thick woody rhizome stout, 3-angled, 1 to 2 ft. high. Leaves 6 to 9 ft. long, 1 in. broad or more, 3-nerved, with scabrous margins. Clusters of spikelets sessile or nearly so, in a dense oblong-thyrsoid panicle, the lower leafy involucral bracts 1 to 2 ft. long.

Spikelets ovoid, 4 to 5 lines long, 2 to 3 lines diameter. Glumes closely imbricate, very broad and thin, many-nerved and readily splitting into as many shreds. Scales as long, apparently more than 6 besides the 2 outer complicate ones or bracteoles, but splitting so readily that I have been unable to ascertain their number. Stamens 6 or in one flower examined 7; anthers very long. Nut ovoid conical or nearly globular, 4 to 6 lines diameter, with 6 to 10 very prominent thick longitudinal ribs, the apex truncate or convex in the Australian specimen frequently conical in others.—*S. sulcatum*, Kurz (by a clerical mistake?) Miq. Ill. Fl. Archip. Ind. 65. t. 28; *Hypolytrum costatum*, Thw. Enum. Pl. Zeyl. 346, according to Kurz.

Queensland. Daintree River, *Fitzalan*.

The single specimen seen in herb. F. Mueller consists only of an inflorescence with ripe nuts, but it agrees very well with some of the Archipelago ones from which I have taken the above description. But even in these, owing to the half-rotten state of the few flowering spikelets remaining, I have been unable to ascertain precisely the real number of the hypogynous scales, which as in *Mapania* and *Lepironia*, are probably like the bristles of *Scirpus* more numerous than the stamens.

12 LEPIRONIA, Rich.

(Chondrachne, *R. Br.*)

Spikelet solitary, lateral, with numerous hermaphrodite flowers. Glumes closely imbricate all round the rhachis, concealing the floral scales, a few of the lowest empty. Flowers flat. Hypogynous scales numerous, 2 outer ones (bracteoles?) placed right and left, complicate, the keel ciliate, the others narrow, flat or nearly so, closely packed in several rows. Stamens 8 or more, alternating with the inner or opposite the outer scales. Style central, with 2 filiform stigmatic branches. Nut flat, not ribbed.—Stems from a creeping rhizome rush-like, transversely septate inside, leafless except sheathing scales. Spikelet oblique at the base of a terete involucral bract continuing the stem.

The genus is limited to the single Australian species, which extends over the Malayan Archipelago, parts of East India and Madagascar. The other species referred to the genus by Miquel belong to *Mapania* (*Pandanophyllum*) as now constituted, which differs in habit and in the reduced number of hypogynous scales and stamens.

1. **L. mucronata,** *Rich. in Pers. Syn.* i. 70.—Rhizome creeping. Stems 2 to 3 ft. high, varying from 1 to 3 lines in thickness, rigid, terete, marked by internal transverse septa giving it an articulate appearance, enclosed at the base by a few long loose sheathing scales, otherwise leafless. Spikelet apparently lateral, in the axil of an erect terete involucral bract strictly continuous with the stem and not dilated at the base, the spikelet varying from shortly ovoid or almost globular and ½ in. long to oblong-fusiform and above 1½ in. long, from rather pale brown to almost black and shining. Glumes exceedingly numerous,

very closely imbricate in spiral rows, broad almost orbicular, obtuse, membranous or rigid, completely concealing the floral scales, 3, 4 or sometimes more of the lower ones empty and shorter. Flowers very flat, the anthers and style-branches only shortly protruding from under the glumes. Hypogynous scales usually about 16 (said to be 8 only in some extra-Australian specimens), the two outer complicate ones or bracteoles with a ciliate keel, the others linear or oblong-linear, shorter than the glume. Stamens 8 or more, alternating with the inner scales or opposite the outer ones, apparently variable in number. Style glabrous. Nut flat, broadly ovate or almost orbicular, rounded at the end or almost acute, smooth or nearly so, without the longitudinal ribs of *Chorisandra.*—Kunth, Enum. ii. 366; Miq. Ill. Fl. Archip. Ind. t. 20; F. Muell. Fragm. ix. 17; *Chondrachne articulata,* R. Br. Prod. 220.

Queensland. East Coast, *R. Brown;* Moreton Bay and environs, *M'Gillivray, F. Mueller, Leichhardt, Bailey.*

N. S. Wales. Port Jackson, *R. Brown;* Richmond River, *Mrs. Hodgkinson.*

Some of the Australian specimens are remarkable for their very large almost black shining spikelet, in others it is light brown and shorter as in the majority of Asiatic specimens. They bear at first sight a striking resemblance to the Restiaceous genus *Ecdeiocolea,* in which however, besides the internal structure, the spikelet is more strictly terminal and erect.

13. CHORISANDRA, R. Br.

Spikelets (or heads) solitary, lateral, with numerous hermaphrodite flowers (or androgynous spikelets). Glumes loosely imbricate all round the rhachis, not longer than the floral scales, a few of the lowest empty. Flowers flat or terete. Hypogynous scales numerous, the 2 outer ones (bracteoles?) placed right and left, complicate, the keel ciliate, the others narrow, flat or nearly so and closely packed in several rows or all spathulate or oblong and flat or concave. Stamens 6 to 12 or more, alternating with the inner or opposite the outer scales. Style central, deeply divided into 2 stigmatic branches. Nut biconvex or ovoid-globular, with about 8 prominent longitudinal ribs.—Stems from a creeping rhizome rush-like, transversely septate inside or continuous. Leaves few at the base of the stem, long terete and stem-like, or all reduced to sheathing scales. Spikelet globular or ovoid.

The genus is endemic in Australia with the exception of one species which extends to New Caledonia. The typical section is closely allied to *Lepironia* with which Endlicher proposed to unite it. The essential structure of the spikelet is the same as well as the general habit and inflorescence, the only difference being in the looser imbrication of the glumes of the globular spikelet, the flowers not quite so flat and the scales showing above or on a level with the glume, giving the spikelet the appearance of a globular head of numerous small spikelets. This appearance is still more striking in the section *Cymbaria* in which the 2 outer scales are scarcely different from the others and the structure might in some measure justify those who consider the spikelet as a head, the flowers as spikelets and the scales as glumes of which the majority have each a stamen in their axil the inner ones empty, and the central pistil without any subtending glume. But the explanation of the structure as above given seems more in accordance with analogy. The two sections are certainly very closely connected, and pass gradually through *Lepironia*, *Scirpodendron*, *Mapania* and *Diplasia*, into *Hypolytrum*.

SECT. I. **Euchorisandra.**—*Spikelet globular, sessile, the base of the involucral bract not at all or scarcely dilated. Two outer hypogynous scales complicate and keeled.*

Stems transversely septate. Glumes acuminate-acute almost aristate. Eastern species	1. *C. sphærocephala.*
Stems continuous, slender. Glumes acute. Southern species east and west	2. *C. enodis.*
Stems transversely septate. Glumes obtuse. Western species	3. *C. multiarticulata.*

SECT. II. **Cymbaria.**—*Spikelet ovoid-globular, half-immersed in the dilated base of the involucral bract. Hypogynous scales all oblong-spathulate and slightly concave.*

Stems transversely septate. Glumes obtuse	4. *C. cymbaria.*

SECTION I. EUCHORISANDRA.—Spikelets globular, sessile, the base of the involucral bract not at all or scarcely dilated. Two outer floral scales complicate and keeled.

1. **C. sphærocephala,** *R. Br. Prod.* 221.—Stems from a short rhizome 1½ to 2 ft. high or more, marked inside by transverse septa giving it an articulate appearance. Leaves few, erect, rigid and stem-like, shorter than the stem, with long open sheaths. Bract terminating the stem and continuous with it, without any basal dilatation. Spikelet globose, sessile, 4 to 5 lines diameter when fully out, almost black. Glumes very numerous, a few outer empty ones short broad and obtuse, the flowering ones lanceolate or ovate-lanceolate, acute and mostly aristate with short fine points giving the spikelet an echinate or hirsute aspect. Flowers flat. Hypogynous scales nearly as long as the glumes, 2 outer ones complicate with acute ciliate keels, the other 12 to 16 somewhat spathulate at the base, very dark at the end, acuminate almost aristate, not keeled but the margins slightly ciliate. Stamens few in the flowers examined, alternating with the inner scales. Nut broadly ovate, biconvex, with about 8 very prominent longitudinal ribs.—Bœckel. in Linnæa, xxxvii. 142; F. Muell. Fragm. ix. 18.

Queensland. Moreton Bay, *C. Stuart.*
N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *F. Mueller*, *C. Moore* and others; Hastings River, *Beckler.*

2. **C. enodis,** *Nees in Pl. Preiss.* ii. 73.—Stems from a creeping rhizome usually about 1 ft. high, rigid but much more slender than in *C. sphærocephala* and without any transverse septa. Leaves few, terete and stem-like, sometimes as long as the stem, the lower ones very short or reduced to loose open sheathing scales. Spikelet globular, sessile, about ½ in. diameter when full grown, dark brown almost black, the bract terminating the stem not at all or scarcely dilated at the base. Glumes broadly ovate, acute or produced into a short point and slightly toothed at the end. Flowers flat. Hypogynous scales as long as the glumes, 2 outer ones broadly spathulate, complicate, the keel ciliate, usually 3-toothed with the central tooth mucronate or aristate; about 12 inner scales obovate-spathulate toothed and ciliate, the inner-

most narrow and more entire. Stamens about 12, alternating with the scales.—Hook. f. Fl. Tasm. ii. 84; F. Muell. Fragm. ix. 18.

Victoria. Hopkins River, *F. Mueller.*
Tasmania. Wet places near George-town, *Gunn.*
S. Australia. Lofty Range, *F. Mueller;* Port Lincoln, *S. M. Browne.*
W. Australia. King George's Sound and neighbourhood, *F. Mueller; Muir, Oldfield, Drummond, n.* 176; Swan River, *Preiss, n.* 1867, 1869; Port Gregory, *Oldfield.*

Bœckeler in Linnæa, xxxvii. 142, unites this with the *C. sphærocephala,* from which it differs in the slender continuous stems, the shape of the glumes, etc.

3. **C. multiarticulata,** *Nees in Ann. Nat. Hist. ser.* 1, vi. 48.—Stems from a thick creeping rhizome 1 to 1½ ft. high, more or less marked with transverse septa, sometimes numerous and very prominent sometimes fewer and faint. Leaves few, one often as long as the stem, the others short or all reduced to loose open sheaths. Spikelets globular, sessile, the bract continuing the stem not at all or scarcely dilated at the base. Glumes very broad, the outer ones orbicular, very obtuse, entire or very slightly denticulate ciliate. Flowers flattened, but not so much as in *C. sphærocephala.* Hypogynous scales as long as the glume, 2 outer ones broadly spathulate, complicate, with ciliate keels; about 12 inner ones spathulate, entire or scarcely denticulate, the innermost narrower. Stamens about as many as scales and alternate with them.

W. Australia. Swan River, *Drummond, 1st coll.;* also n. 198 and 356.

SECTION II. CYMBARIA.—Spikelet ovoid-globular, half-immersed in the dilated base of the involucral bract. Floral scales all oblong-spathulate and slightly concave.

4. **C. cymbaria,** *R. Br. Prod.* 221.—Stems from a thick creeping rhizome 2 to 3 ft. high or even more, rigid, rush-like, more or less distinctly marked with transverse septa. Leaves few, erect, terete and stem-like, often longer than the stem, with long loose open sheaths or the lower ones reduced to sheathing scales. Spikelet ovoid or nearly globular, erect but half immersed in the dilated base of the erect involucral bract so as to appear adnate. Glumes very broad, obtuse, membranous. Flowers not flattened. Hypogynous scales about 15, rather longer than the glumes, imbricate, oblong-spathulate in the upper part, dark-coloured, somewhat concave, denticulate or jagged. Stamens about 12, alternating with the inner scales (or opposite the outer ones). Nut obovoid-globular 1¼ lines diameter, with about 8 very prominent longitudinal ribs.—F. Muell. Fragm. ix. 18.

Queensland. Brisbane River, Moreton Bay, *F. Mueller, Leichhardt, Bailey.*
N. S. Wales. Port Jackson, *R. Brown, Sieber, n.* 28, *Woolls;* near Cape Howe, *F. Mueller.*
Victoria. Bunip and Tabernacle Creeks, Gipps' Land, *F. Mueller.*
W. Australia. *Drummond, n.* 383. These specimens are in fruit and the eastern ones I have seen are in flower only, but all appear to belong to one species, and the same or a very closely allied one is in the Isles of Pines, New Caledonia.

TRIBE III. RHYNCHOSPOREÆ.—Spikelets capitate spicate or paniculate, rarely solitary or umbellate, with 1 rarely 2 (in *Schœnus* 2 to 6) hermaphrodite fertile flowers and sometimes 1 or more male or sterile flowers above or below. Empty glumes at the base often more than 2. Hypogynous scales or bristles when present filiform or flat.

14. OREOBOLUS, R. Br.

Spikelet 1-flowered. Glumes 3, imbricate. Hypogynous scales (perianth-segments) 6, in 2 series but nearly equal. Stamens 3. Style slender, continuous with the ovary, not thickened at the base, deciduous, with 3 stigmatic branches. Nut ovoid, smooth. Dwarf much-branched plants forming dense cushion-like leafy tufts. Spikelets solitary in the upper axils or apparently terminal.

Besides the Australian species, which is also in New Zealand, there is one from Antarctic and Andine South America, closely allied to it.

1. **O. pumilio,** *R. Br. Prod.* 236.—Stems much branched, usually under ½ in. long, in very dense cushion-like tufts of several in. diameter, but some barren branches lengthen out to 1 or 2 in. or in some New Zealand specimens to 3 or even 4 in., always completely covered by the imbricate leaf-sheaths. Leaves exactly distichous with equitant bases, or sometimes less regularly imbricate, erect or incurved, narrow, rigid, varying from ½ in. to near 2 in. long, obtuse or almost acute, 3-nerved or smooth on the back, the short sheaths open. Spikelets 1 or 2 on the flowering branch, in one of the upper axils or at the end, each on a peduncle at first very short, but sometimes lengthening after flowering to ½ in. Glumes narrow, erect, acute, the outer one leaflike, 3-nerved, ciliate on the midrib or keel, often 2 lines long, the second shorter, with the keel green but scarcely ciliate, the third still shorter but much longer than the ovary (and said to be sometimes deficient), and in some specimens all three glumes smooth and glabrous. Hypogynous scales or perianth-segments narrow-lanceolate, acute, all equal and about as long as the nut, and often persistent after it has fallen away. Nut ovoid-oblong, obtuse.—Kunth, Enum. ii. 367; Bœckel. in Linnæa, xxxviii. 230 (misspelt *Oreobulus*); Hook. f. Fl. Tasm. ii. 94; F. Muell. Fragm. ix. 20; *O. distichus*, F. Muell. in Trans. Phil. Soc. Vict. i. 109, and in Hook. Kew Journ. viii. 335; *O. pectinatus*, Hook. f. Fl. Ant. i. 87, t. 49.

Victoria. Summits of all the Alps from Mounts Baw-baw and Buller to Mount Kosciusko, *F. Mueller.*

Tasmania. Table Mountain (Mount Wellington), *R. Brown*; summits of all the mountains at an elevation of 3000 to 5000 ft., *J. D. Hooker.*

This genus is always characterised after Brown as having two glumes with or without a single inner scale. In all the specimens I have examined from Tasmania, Victoria, New Zealand and South America, I have invariably found three glumes, all longer than the ovary and nut, the second exactly intermediate in size and aspect between the first and the third. The Andine species differs slightly from the Australian one in the leaves never distichous, with thicker broader sheathing bases, but in some of the specimens from Tasmania, as well as in some Victorian ones gathered by F. Mueller on the Bogang range the leaves are certainly not distichous, and these come very near to the American *O. obtusangula*, Gaudich. The hypogynous scales assume more the aspect of perianth-segments in this genus than in any other, and indeed closely resemble the perianths of *Juncus* or of *Restiaceæ*.

15. REMIREA, Aubl.

Spikelets small, densely capitate, with a single terminal hermaphrodite flower. Glumes 4, the 2 outer ones imbricate, the third larger, membranous, enveloping the fourth which is thick and fleshy, enclosing the flower. No hypogynous scales or bristles. Stamens 3. Style continuous with the ovary, not thickened at the base, deciduous; stigmatic branches usually 3, filiform. Nut closely enveloped in the inner 2 glumes, ovoid-triquetrous, often slightly compressed.—Low branching perennial. Leaves linear, with short imbricate sheathing bases. Spikelets very numerous, in ovoid sessile spikes solitary or clustered and surrounded by leafy involucral bracts.

The genus is limited to the single Australian species, which is dispersed along the sandy sea-coasts of most tropical countries.

1. **R. maritima,** *Aubl. Pl. Gui.* i. 45, *t.* 16, var. *pedunculata.*—Stems from a creeping and rooting base ascending or erect, much branched, a few inches high, completely covered with the imbricate bases of the leaves in the typical form, produced into a peduncle in the Australian variety. Leaves rigid, 1 to 3 in. long, 1½ to 3 lines broad at the base, tapering into a point often pungent, dilated at the base into a short open sheath. Spikes ovoid, 4 to 6 lines long, solitary or more frequently several together sessile in a terminal head or cluster surrounded by 3 to 6 involucral bracts, the longest 1 to 2 in. long. Spikelets very numerous, terete, usually about 2 lines long, subtended by a glume-like bract. Lower glume short, the second longer, both broad and appressed but open longitudinally, the third 2 lines long, membranous, very broad but closely wrapped round the fourth or flowering glume, which is shorter and much thickened, becoming harder round the ripe nut.—Bœckel. in Linnæa, xxxv. 435; *R. pedunculata*, R. Br. Prod. 236, Kunth, Enum. ii. 139; F. Muell. Fragm. ix. 20.

Queensland. Abundant on the sandy sea-shores of the eastern coast, *R. Brown*, *A. Cunningham*, *Dallachy*.

In the typical American specimens, as in the majority of the African and some of the East Indian ones, the branches are leafy almost or quite up to the involucral bracts. In the Australian variety, which is common in the Malayan Archipelago and less developed in India, the peduncle is produced above the leaves to a length of from ½ to 2 or even near 3 in., but there is no difference in the structure of the spikelets, and the Indian specimens distinguished by Nees under the name of *R. Wightiana*, Wall. are quite intermediate, the peduncle varying from a line or two to an inch in length. The genus, often placed next to *Kyllinga*, which it resembles in inflorescence, has been more appropriately removed by Bœckeler to the neighbourhood of *Rhynchospora* to which it is more nearly allied in the structure of the spikelets.

16. RHYNCHOSPORA, Vahl.

(Cephaloschœnus and Morisia, *Nees*.)

Spikelets capitate or paniculate, with 1 or 2 hermaphrodite flowers and often 1 or 2 males, oblong, more or less acuminate. Glumes imbricate all round the rhachis; 3, 4 or more outer ones shorter and empty, and 1 or 2 above the flowering ones enclosing male flowers or empty. Hypogynous bristles 6, rarely fewer, sometimes more. Stamens 3 or fewer. Style slender, conically dilated at the base; stigmatic branches 2. Nut globular or more or less flattened, crowned by the persistent conical or elongated base of the style, which is sessile and continuous or separated by a constriction but not distinctly articulate.—Stems simple under the inflorescence, usually leafy. Spikelets usually of a rich brown, more or less clustered, in terminal or axillary heads or corymbs sometimes forming large terminal panicles.

The genus is widely spread over the tropical and temperate regions of the New and the Old World. Of the five Australian species three have a very extended tropical range, two at least if not the third being common in America as well as in the Old World. The two others have not yet been identified with extra-Australian species.

- Spikelets clustered in a compound panicle, the partial panicles corymbose or cymose.
  - Spikelets 3 to 4 lines long, very numerous, the terminal corymb 3 to 4 in. diameter. Beak of the nut long and thick, usually furrowed . . . . 1. *R. aurea.*
  - Spikelets 2 to 3 lines long, in loose corymbs of ½ to 1 in. diameter. Beak of the nut not longer than the nut and closely sessile . . . . 2. *R. glauca.*
- Spikelets in a single dense terminal head.
  - Hypogynous bristles shorter than the nut. Nut smooth, broadly obovoid, with a very short beak. Stem usually above 1 ft. . . . . 3. *R. Wallichiana.*
  - Three at least of the bristles much longer than the nut. Nut oblong. Stem usually under 1 ft.
    - Spikelets 4 to 5 lines long. Nut tuberculate or hispid, the beak closely sessile and often as long as the nut. Leaves shorter than the stem . . . . . 4. *R. longisetis.*
    - Spikelets about 3 lines. Nut smooth or nearly so, the beak short and constricted at the base. Leaves often as long as the stem . . . . 5. *R. tenuifolia.*

R. tenerrima, Nees in Spreng. Syst. Cur. Post. 26, correctly referred to the *R. setacea*, Bœckel. (*Schœnus setaceus*, Rottb. *Dichromena*, Kunth), was supposed to be Australian on the authority of Sieber's specimens, Agrostoth. n. 116, which are however evidently West Indian.

1. **R. aurea**, *Vahl; Kunth, Enum.* ii. 293.—Stems 2 to 3 ft. high, 3-angled, leafy throughout. Leaf-sheaths terminating in a short broad membranous ligula, the blade long, pointed, with scabrous edges. Spikelets very numerous, clustered in more or less corymbose panicles almost shortened into compound umbels, usually one large terminal one 3 to 4 in. diameter and 1 to 3 smaller axillary ones lower down the stem. Floral leaves or bracts usually longer than the inflorescence. Spikelets 3 to 4 lines long, with 1 perfect flower and 1 or 2 males.

Hypogynous bristles 6, usually longer than the nut but scarcely so long as the beak. Nut obovate, often scabrous, especially in the centre of each side, the beak sessile, as long as the beak or longer and as broad at the base, usually but perhaps not always furrowed on each side.—Bœckel. in Linnæa, xxxvii. 626: R. Br. Prod. 230; F. Muell. Fragm. ix. 17.

Queensland. Endeavour River, *Banks and Solander;* Rockingham Bay, *Dallachy;* Brisbane River, *Bailey.*

Widely spread over the tropical regions of the New and the Old World, and divided by Bœckeler and others into several species, the characters of which I have failed to appreciate.

2. **R. glauca,** *Vahl; Kunth, Enum.* ii. 297.—Stems angular and 1 to 2 ft. high or even more but slender. Leaves few narrow and distant, the radical ones sometimes as long as the stem. Spikelets not very numerous, clustered in small loose irregular corymbs ½ to nearly 1 in. diameter, the terminal one more compound, with several small distant ones shortly pedunculate in the upper axils. Spikelets 2 to 3 lines long, with 1 or 2 hermaphrodite and 1 or 2 male flowers. Outer empty glumes 3 or 4, short. Hypogynous bristles 6 or 7, mostly rather longer than the nut. Nut obovate, marked with minute transverse wrinkles, the beak conical shorter than or nearly as long as the nut, sessile, not furrowed.—Bœckel. in Linnæa, xxxvii. 585; F. Muell. Fragm. ix. 17; *R. laxa,* R. Br. Prod. 230; Kunth, l. c. 298; *R. Brownii,* Rœm. et Schult. Syst. ii. 86; Bœckel. l. c. 581.

Queensland, Endeavour River, *Banks and Solander;* Brisbane River, Moreton Bay, *F. Mueller.*

N. S. Wales. Port Jackson, *R. Brown;* Hastings River, *Beckler,* New England, *C. Stuart.*

Extends over the tropical and subtropical regions of the New and the Old World. Kunth distinguished *R. glauca* and *R. laxa* chiefly as being the one American the other of the Old World. Bœckeler admits the two species as in both hemispheres, distinguishing them upon characters which are not very clear to me.

3. **R. Wallichiana,** *Kunth, Enum.* ii. 289.—Stems 1 to 2 ft. high, leafy at the base only. Leaves narrow, nearly as long as the stem or much shorter, the outer ones with open sheaths not ciliate, the inner one with a long close sheath. Spikelets numerous in a dense globular head. Involucral bracts spreading, the longest 2 to 3 in. long. Spikelets brown, 2½ to 3 lines long, with 1 hermaphrodite and often 2 male flowers, and 3 or 4 outer empty glumes. Hypogynous bristles not so long as the nut and sometimes very short. Nut obovate-orbicular, smooth, the beak scarcely one third of its length.—Bœckel. in Linnæa, xxxvii. 542; F. Muell. Fragm. ix. 17: *Morisia Wallichii,* Nees; Hook. f. Fl. Tasm. Præf. 48.

N. Australia. Port Essington, *Armstrong.*

Queensland. Rockingham Bay, *Dallachy;* Wide Bay, *Bidwill;* Brisbane River, *Bailey.*

Extends over tropical Asia and Africa, and the same or a closely allied species is also in America.

4. **R. longisetis,** *R. Br. Prod.* 230.—Stems 6 in. to 1 ft. high. Leaves shorter, mostly at the base of the stem, narrow, with loose open ciliate sheaths, the inner one or two with close sheaths reaching sometimes halfway up the stem. Spikelets numerous, in a dense terminal globular head. Involucral bracts spreading or reflexed, the longest 2 to 4 in. long, linear, subulate-acuminate, dilated and ciliate at the base. Spikelets 4 to 5 lines long, acuminate, of a pale shining brown, 3 or 4 of the outer glumes shorter and empty. Hypogynous bristles 3 much longer than the nut and often as long as the glume, 3 or 2 much shorter. Nut oblong, biconvex, more or less tuberculate, the beak as long as or rather shorter than the nut and closely sessile upon it by its broad base.—Kunth, Enum. ii. 289; Bœckel. in Linnæa, xxxvii. 541; *R. pterochæta*, F. Muell. Fragm. ix. 17.

N. Australia. Gulf of Carpentaria, mainland and Groote Island, *R. Brown*; Upper Victoria River, *F. Mueller;* between Norman and Gilbert Rivers, *Gulliver*.
Queensland. Rockingham Bay, *Dallachy*.

5. **R. tenuifolia,** *Benth.*—Very near *R. longisetis*, but with smaller spikelets and a different fruit. Stems slender, 6 to 8 in. high. Leaves numerous, very narrow and often longer than the stem, the outer ones with open sheaths scarcely ciliate, the inner sheaths longer and more closed. Inflorescence and involucral bracts as in *R. longisetis*, but the spikelets scarcely above 3 lines long when fully out. Hypogynous bristles 3 nearly as long as the glume, 3 scarcely longer than the nut. Nut oblong, slightly biconvex, bordered by a nerve-like margin, smooth or scarcely tuberculate, the beak not half so long and abruptly contracted at the base so as to appear stipitate.—*R. longisetis*, F. Muell. Fragm. ix. 17, not of R. Br.

N. Australia. Victoria River, *Elsey*.
Queensland. Rockingham Bay, *Dallachy*.

17. CYATHOCHÆTE, Nees.

(Tetralepis, *Steud.*)

Spikelets in a long narrow little-divided panicle, with 1 hermaphrodite fertile flower and a second male or sterile one below it. Glumes usually 4, imbricate all round the rhachis, the 2 outer ones empty, the 2 inner longer, broad, and closely enveloping the flowers. Hypogynous bristles usually 4, long rigid and acute. Stamens usually 2. Style long, thickened towards the base, long persistent; stigmatic branches usually 2, filiform. Nut where known oblong, resting on a thick gynophore, not ribbed, crowned at first by the thickened base of the style, which may be at length deciduous.—Stems from a perennial rhizome usually tall, leafy chiefly at the base, the few stem-leaves passing into the leafy bracts. Spikelets narrow. Flowers here and there but rarely 3-merous. Styles and stamens sometimes very long.

The genus is endemic in Australia and though technically allied to *Carpha* and *Mesomelæna* it is widely different in habit. Nees in characterising the genus in Pl. Preiss. ii. 86, refers to it as published in the Linnæa, ix. 300, n. 71; but that is a mistake, as he there only establishes the S. African genus *Cyathocoma*, which he subsequently referred to as allied to *Cyathochæta*.

Stems 6 to 8 ft. Spikelets nearly 2 in. long, 1 or 2 in each sheath. Western species . . . . 1. *C. clandestina.*
Stems about 2 ft. Spikelets ¾ to 1 in. long, few in each sheath. Western species . . . . 2. *C. avenacea.*
Stems about 2 ft. Spikelets about ½ in. long, several in each sheath. Eastern species. . . . . 3. *C. diandra.*

1. **C. clandestina,** *Benth.*—Stems terete, attaining 7 or 8 ft. Leaves crowded at the base, often above 1 ft. long, with distichous sheaths of 2 to 3 in., crowned at the orifice by a brown lacerated membrane, the lamina erect and rigid, 1 line broad in the upper part; a few leaves on the stems with long sheaths and short laminæ. Floral sheathing bracts long and loose with short laminæ along the upper part of the stem, the uppermost gradually shorter with short points. Spikelets usually 2 within each sheath and scarcely protruding from it or 1 on a longer peduncle, each one nearly 2 in. long, narrow and scarcely flattened. Glumes about 4, not distichous, the 2 outer empty ones shorter. Hypogynous bristles 4, rigid, shorter than the glumes, ciliate almost plumose below the middle. Stamens 2, the filaments 1 in. longer than the glumes and the anthers another inch long. Style as long, with 2 stigmatic branches. Nut oblong, crowned by the hardened base of the style, but not seen fully formed.—*Carpha clandestina*, R. Br. Prod. 231; *Rhynchospora clandestina*, Spreng. Syst. i. 194; *Chætospora clandestina*, F. Muell. Fragm. ix. 40.

W. Australia. King George's Sound, *R. Brown;* Wilson's Inlet, *Oldfield.*

2. **C. avenacea,** *Benth.*—Stems rigid, attaining 2 ft. or more, terete below the infloresence. Leaves at the base of the stem shorter, erect, very narrow, with incurved or involute margins ending in long linear points, the sheaths open without any membrane. Panicle long and very narrow, the branches or peduncles few, long and erect, generally 2 or 3 together in each bract. Lower floral bracts with long sheaths open some way down, the lamina flatter than in the radical leaves but very narrow, the upper ones gradually shorter. Spikelets few on each peduncle and often solitary, ¾ to 1 in. long, pale coloured, very narrow and acuminate. Glumes 4, not distichous, acuminate or the lower one aristate, the 2 outer empty ones shorter. Hypogynous bristles in the hermaphrodite flower not very long, ciliate at the base and none in the lower barren flower in the 2 spikelets examined. Stamens 2, and style 2-branched, all very much longer than the glume; anthers not seen. Nut long and narrow, grooved along one side and crowned by the hardened base of the style but not seen ripe.—*Carpha avenacea*, R. Br. Prod. 230; *Rhynchospora avenacea*, Spreng. Syst. i. 197; *Cyathochæta diandra*, Nees in Pl. Preiss. ii. 86, as to Preiss's plant but not the

synonym; *Tetralepis australis*, Steud. Syn. Glum. ii. 159; *Chætospora avenacea*, F. Muell. Fragm. ix. 40.

W. Australia. King George's Sound and neighbouring districts, *R. Brown*, *Oldfield*, *Drummond*, *n.* 367, *Muir;* Swan River, *Miss Lukin*, (the flowers very young but apparently the same), *Preiss*, *n.* 1836. I have not seen these specimens of Preiss's, but Nees' description applies clearly to the Western *C. avenacea*, and not to the Port Jackson *C. diandra*.

3. **C. diandra,** *Nees in Pl. Preiss.* ii. 86 (as to Brown's synonym but not the plant described).—Stems slender, terete or nearly so, above 2 ft. long. Lower leaves not seen; upper ones with long half-open sheaths and long very narrow concave or angular laminæ ending in long points. Panicle often 1 ft. long, looser than in *C. avenacea*, with slender erect compound branches, the lower bracts leaflike, the upper ones small. Spikelets rather numerous on the branches, very narrow, acute, of a rich brown, about ½ in. long. Glumes flowers and young nuts as in *C. avenacea*, except that there appears to be occasionally though very rarely a third stamen and a fifth or even a sixth hypogynous bristle.—*Carpha diandra*, R. Br. Prod. 231; *Rhynchospora diandra*, Spreng. Syst. i. 197; *Chætospora diandra*, F. Muell. Fragm. ix. 39.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls*, *Mrs. Calvert*.

18. SCHŒNUS, Linn.

(Chætospora *R. Br.* Isoschœnus *and* Helothrix, *Nees.* Gymnochæta, *Steud.*)

Spikelets variously capitate paniculate or solitary, with 2 or more (rarely 6) flowers, all hermaphrodite and fertile or the uppermost sterile. Glumes distichous, several outer ones or sometimes only 2 or 1 empty, the rhachis very short and straight between the empty glumes, more or less elongated and curved between the flowering glumes and flexuose, the flowers seated in the alternate notches, and the rhachis shortly produced above the last flower bearing a small empty glume. Hypogynous bristles or sometimes scales 6, or few and unequal, or none, often ciliate at or near the base, rarely much longer than the nut. Stamens 3 or very rarely 4 to 6 or only 1. Style slender or rarely slightly thickened towards the base, deciduous; stigmatic branches 3, filiform, sometimes almost plumose. Nut obovoid ovoid or rarely oblong or globular, more or less distinctly 3-angled or 3-ribbed, smooth reticulate foveolate or tuberculate.—Usually perennials, the stems often rigid and leafless below the inflorescence. Leaves either radical or at the base of the stem, narrow or subulate or reduced to the brown sheaths, or in a few species the stem leafy, either tall and rigid or short and weak or filiform and floating. Spikelets when capitate in sessile clusters within the head, the clusters and spikelets subtended by glume-like bracts, and the outer bracts of the head forming an involucre with or without leaflike laminæ; when paniculate the peduncles spikelets or branches of the panicle clustered within

sheathing bracts, with or without leaflike laminæ, the lower ones usually distant. Glumes frequently dark-coloured or black.

The genus is almost limited to the Old World and is chiefly Australian, but represented by a few species in the temperate regions of the northern hemisphere, in extra-tropical South America, in South Africa and New Zealand, and one in the Malayan Archipelago. Of the fifty-five Australian species three are also in New Zealand and one of them in South America; the remainder are as far as known all endemic.

I have found it impossible to maintain the distinction between *Schœnus* and *Chætospora* founded on the absence or presence of the hypogynous bristles, for still more than in *Scirpus*, there are several species where they are quite inconstant, and in many cases two very closely allied species would have to be placed in different genera. The flexuose rhachis, always produced beyond the fertile flower or flowers which are seated in the notches thus formed, appears to me to be a more constant character. In this respect and in the frequent decurrence of the upper flowering glumes forming a wing on each side of the rhachis, *Schœnus* approaches the sections *Diclidium* and *Mariscus* of *Cyperus*, differing chiefly in the inflorescence, the brown or black more membranous glumes, the more numerous distichous empty ones and the few flowering ones less distinctly distichous, the frequent presence of bristles, etc., no one of these characters being constant although one or the other of them prevalent, so that difficult as it is to assign special distinctive characters the two genera appear never to have been confounded.

Numerous as are the Australian species of *Schœnus*, I have been unable to divide them into distinct sections founded on anyessential character. The variations in the number of glumes, in the hypogynous bristles, in the number of stamens, in the nuts, etc., are specific only, and I have felt obliged to arrange the species into series only, derived chiefly from inflorescence.

SERIES I. **Macrocephalæ.**—*Spikelets narrow, 5 to 6 lines long, sessile in a single oblong or ovoid terminal head with erect involucral bracts. Hypogynous bristles present. Leaves tufted at the base of the stem. Western species.*

Outer bract broad and black at the base. Glumes glabrous, 2 outer empty ones. Hypogynous bristles slender . . 1. *S. cruentus.*
Outer bract brown and rather narrow at the base. Glumes glabrous, 1 outer empty one. Hypogynous bristles short, ciliate . . . . 2. *S. compressus.*
Outer bract narrow. Glumes woolly on the edge, about 4 outer empty ones. Hypogynous bristles longer than the nut, plumose . . . . 3. *S. lanatus.*

SERIES II. **Sphærocephalæ.**—*Spikelets 1 to 3 lines long, very numerous and sessile in a globular or broadly turbinate head, with spreading subulate involucral bracts. Hypogynous bristles rarely deficient. Leaves tufted at the base of the stem.*

Heads globular. Western species.
  Spikelets about 3 lines. Glumes acute or aristate, 5 or more outer empty ones. Leaves not above 2 or 3 in.
    Spikelets black. Hypogynous bristles as long as the nut, ciliate . . . . 4. *S. curvifolius.*
    Spikelets brown. Hypogynous bristles scarcely any, or very small and fine . . . . 5. *S. subbulbosus.*
  Spikelets about 2 lines. Glumes acute, only 1 or no outer empty one. Hypogynous bristles none or very minute. Leaves long and capillary . . . . . . 6. *S. setifolius.*

Spikelets about 1 line. Glumes obtuse, 2 outer empty ones. Leaves few, erect, rigid. Hypogynous bristles as long as the nut or small . . . . 7. *S. Drummondii.*
Heads broadly turbinate. Spikelets about 3 lines. Glumes acute, 3 or 4 outer empty ones. Hypogynous bristles as long as the nut. Leaves capillary. Eastern species . . . . 8. *S. turbinatus.*

Series III. **Isoschœneæ.**—*Spikelets in a single terminal head but either few in the head sometimes only* 2 *or* 3, *or if numerous spreading or the head loose. Hypogynous bristles none except in* S. brevisetis, *and then very short.*

Spikelets above 3 lines long. Western species.
  Involucral bracts 2 or 3, subulate curved and longer than the head.
    Bract-sheaths densely bearded. Spikelets 2 to 4 in the head . . . . 9. *S. barbatus.*
    Bract-sheaths glabrous or nearly so. Spikelets 6 or more in the head . . . . 10. *S. flavus.*
  Involucral bracts short or only 1 exceeding the head and rigid.
    Leaf-sheaths bearded. Spikelets 5 or 6 lines, 2 to 4 in the head. Hypogynous bristles present but very short and ciliate . . . . 11. *S. brevisetis.*
    Leaf-sheaths crowned by a membrane, not bearded. Spikelets scarcely 4 lines, several in the head. No hypogynous bristles . . . . 12. *S. armeria.*
Spikelets 3 lines or shorter. Involucral bracts short or only 1 exceeding the head. Eastern species.
  Leaf-sheaths not bearded, the points very short. Spikelets 2 lines. Stamens 4 to 6 . . . . 13. *S. aphyllus.*
  Leaf-sheaths not bearded, the points or laminæ subulate. Spikelets 3 lines. Stamens 3 . . . . 14. *S. imberbis.*
  Leaf-sheaths bearded, the subulate points short. Spikelets 3 lines. Stamens 3 . . . . 15. *S. ericetorum.*

Series IV. **Laterales.**—*Spikelets not above* 2 *lines long, in a single lateral head or cluster or rarely solitary, the erect involucral bract continuing the stem. Hypogynous bristles ciliate.*

Leaf-sheaths not bearded. Spikelets brown. Glumes obtuse. Bristles longer than the nut . . . . 16. *S. nitens.*
Leaf-sheaths bearded. Spikelets black. Glumes very acute. Bristles very short . . . . 17. *S. cygneus.*

(The head of spikelets is also sometimes slightly oblique with an erect bract in 11. *S. brevisetis* and some others of the *Isoschœneæ*).

Series V. **Oligostachyæ.**—*Dwarf plants, rarely above* 6 *in. Spikelets solitary or* 2 *rarely* 3 *or* 4 *together, all terminal and erect. Hypogynous bristles none or short. Western species.*

Stems under 2 in. Spikelets 2 to 3 lines. Stamens 3.
  Leaf-sheaths with very short points. Spikelets 1 or 2, two lines long. Involucral bract short. No hypogynous bristles . . . . 18. *S. minutulus.*
  Leaves subulate, as long as the stem. Spikelets 1 or 2, 2 lines long. Involucral bract long and subulate . 19. *S. trachycarpus.*
  Leaves filiform, shorter than the stem. Spikelets 2 to 4, 3 lines long. Involucral bract short. Hypogynous bristles present . . . . 20. *S. nanus.*

Stems 3 to 6 in. Spikelet solitary, brown, 4 lines long. Bract short. No hypogynous bristles. Stamens 4 to 6 . . . . 21. *S. pleiostemoneus.*
Stems under 1 in. Leaves and involucral bracts long. Spikelets 2, pale-coloured, 6 to 7 lines long. No hypogynous bristles. Stamens 3. . . . . 22. *S. breviculmis.*
Stems 2 to 5 in. Leaf-sheaths bearded, with short laminæ. Spikelets solitary, about 5 lines. Hypogynous bristles present . . . . 23. *S. deformis.*
Stems 6 to 9 in. Leaves short, often woolly. Spikelets solitary, 1 in. long. Bract short. Hypogynous bristles present . . . . 24. *S. unispiculatus.*
Stems filiform 10. Leaf-sheaths with very short points. Spikelet solitary, 5 to 8 lines long. Hypogynous scales present . . . . 25. *S. tenuissimus.*

Series VI. **Strictæ.**—*Leaves usually long. Spikelets erect or on erect peduncles in a narrow panicle, sometimes shortened into a spike but the lower flowering sheaths often distant. No hypogynous bristles. Stamens* 3. *Species all Western except* S. Moorei *and* S. villosus.

Spikelets 1 to 3 in each bract. Outer empty glume 1 or none. Leaves at the base of the stem.
  Stems 3 to 6 in. Leaves much shorter, obtuse, ½ to 1 line broad, not ribbed. Spikelets 5 to 6 lines . . . 26. *S. obtusifolius.*
  Stems 6 to 12 in. Leaves rather long, with 2 or 3 prominent ribs on each side. Spikelets 5 to 6 lines . . . . 27. *S. grammatophyllus.*
  Stems 9 to 18 in. Leaves slender, subulate-acuminate. Spikelets 4 to 5 lines . . . . 28. *S. asperocarpus.*
  Stems 6 to 9 in. Leaves rather shorter, almost subulate, not ribbed. Spikelets 4 to 5 lines . . . 29. *S. Moorei.*
Spikelets many, clustered in the upper bracts. Outer empty glumes several.
  Leaves at the base of the stem. Spikelets 4 to 5 lines. Glumes woolly-ciliate . . . . 30. *S. villosus.*
  Stem tall, leafy. Spikelets 8 to 9 lines, glabrous . . . 31. *S. grandiflorus.*

Series VII. **Calostachyæ.**—*Spikelets large* (*except in* S. acuminatus), *pedunculate in distant sheaths, solitary or very few in each sheath. Outer empty glumes numerous, regularly distichous. Stamens* 3.

Spikelets 1 in. Glumes acute. Hypogynous bristles present. Sheathing bracts with leafless laminæ . . 32. *S. calostachyus.*
Spikelets ¾ to 1 in. Glumes obtuse with gland-like tips. No hypogynous bristles. Sheathing bracts with very short obtuse points.
  Peduncles scabrous. Outer empty glumes 5 or 6. Eastern species . . . . 33. *S. scabripes.*
  Peduncles smooth. Outer empty glumes 10 to 12. Western species . . . . 34. *S. multiglumis.*
Spikelets ½ to ¾ in. Glumes acute. No hypogynous bristles. Sheathing bracts with short acute points . . 35. *S. efoliatus.*
Spikelets under ½ in. Glumes acute. No hypogynous bristles. Sheathing bracts with short points . . . 36. *S. acuminatus.*

(See also 24. *S. unispiculatus*).

Series VIII. **Paniculatæ.**—*Spikelets under ½ in. long, usually dark brown or black, often falcate, all pedunculate, either numerous in a panicle usually secund or rarely few in a terminal cluster.*

Panicle or cluster short and dense. Stems rushlike.
Leaf-sheaths at the base only with very short points. . . . .
Leaf-sheaths bearded at the orifice. Spikelets few, 5 to 6 lines long. Hypogynous bristles present . . . . 37. *S. pedicellatus.*
Leaf-sheaths bearded. Spikelets numerous, 4 to 5 lines long. No hypogynous bristles. . . . . 38. *S. fascicularis.*
Leaf-sheaths not bearded. Spikelets numerous, about 5 lines. No hypogynous bristles . . . . 39. *S. brevifolius.*
Panicle loose but narrow. Leaf-sheaths bearded, with short or subulate points. Hypogynous bristles none or fine and rare.
No leaf-sheaths between the basal and floral ones. Spikelets black, flat, 3 to 4 lines. Nut granular, tuberculate . . . . 40. *S. melanostachyus.*
Leaf-sheaths few on the stem, with short subulate points. Spikelets brown, acute, scarcely flattened, 4 lines. Nut smooth . . . . 41. *S. sparteus.*
Leaf-sheaths several, distant, with linear laminæ. Spikelets brown, scarcely flattened, about 5 lines . . . . 42. *S. vaginatus.*
Panicle loose and much branched with very numerous spikelets. Stem leafy, the lower leaves very long. No hypogynous bristles.
Leaves nearly 2 lines broad at the base, tapering into long points. Spikelets 4 to 6 lines . . . . 43. *S. falcatus.*
Leaves subulate from the base. Spikelets 2 lines . . 44. *S. punctatus.*

SERIES IX. **Laxæ**.—*Spikelets under ½ in. long, few on slender pedicels. Hypogynous bristles present. Leaves at the base of the stem very narrow or subulate. Western species.*

Stems loosely hairy in the lower part. Spikelets dark-brown, about 3 lines long . . . . 45. *S. indutus.*
Stems glabrous. Spikelets black, very flat, 4 to 5 lines long . . . . 46 *S. bifidus.*

SERIES X. **Microcarpæ**.—*Spikelets small in a terminal loose cluster or irregular umbel or clustered in the axils of distant leafy bracts. Nuts* (*except in* S. fluitans) *very small and white. Small or slender and weak plants with flaccid leaves.*

Spikelets black, in a terminal cluster or irregular umbel, with few axillary clusters lower down.
Hypogynous bristles present. Nut smooth or nearly so. Eastern species . . . . 47. *S. Brownii.*
No hypogynous bristles. Nut smooth. Eastern species . . . . 15. *S. ericetorum.*
No hypogynous bristles. Nut deeply foveolate-reticulate. Western species . . . . 48. *S. odontocarpus.*
Spikelets pale-coloured, 2 to 3 ½ lines long, very narrow, in distant clusters, the lower bracts leafy. Western species.
Hypogynous bristles ciliate, almost plumose . . . . . 49. *S. humilis.*
Hypogynous bristles none or very rare and not ciliate . 50. *S. sculptus.*
Spikelets 1 line long in the axils of distant leaves or leafy bracts. Hypogynous bristles present . . . . . . 51. *S. axillaris.*
Spikelets 2 to 5 lines long, very narrow, one terminal and usually 1 or 2 lower down.
Stems short and filiform. No hypogynous bristles. Stamen 1 . . . . 52. *S. tenellus.*
Stems long and floating. Stamens 3.
Hypogynous bristles ciliate, almost plumose. Western species . . . . 53. *S. natans.*
No hypogynous bristles. Eastern species. . . . . . 54. *S. fluitans.*

SERIES I. MACROCEPHALÆ.—Spikelets narrow, 5 to 6 lines long, sessile in a simple oblong or ovoid terminal head, with erect involucral bracts. Hypogynous bristles present. Leaves tufted at the base of the stem.

1. **S. cruentus,** *Benth.*—Stems from a knotty almost bulbous base slender but rigid, 1 to 2 ft. high. Leaves at the base of the stem and much shorter, erect, almost subulate, rigid, somewhat angular, the sheaths open with scarious margins not ciliate. Flower-head ovoid-oblong, compact, black, about ¾ in. long. Involucral bracts with a broad black base enclosing the spikelets, the outer one with an erect rigid point or lamina of 1 to 3 in., the second with a short point, the inner ones gradually more glume-like. Spikelets numerous, about ½ in. long, with 2 or 3 flowers. Glumes membranous at the base, rigid at the end and acuminate, not fringed, outer empty ones usually 2, the lowest shorter, and a narrow empty one at the end of the rhachis. Hypogynous bristles 6, slender, not much longer than the nut. Stamens 3. Nut not seen ripe.—*Chætospora cruenta,* Nees in Pl. Preiss. ii. 85; Bœckel. in Linnæa, xxxviii. 293; F. Muell. Fragm. ix. 37.

W. Australia. King George's Sound and adjoining districts, *Preiss, n.* 1790, *Drummond, n.* 108, 253, *F. Mueller.*

This species is the nearest approach to *Mesomelæna* in aspect, but the flexuose rhachis, the bristles, the slender deciduous style, etc. are quite those of *Schœnus* (*Chætospora*).

2. **S. compressus,** *Benth.*—Stems from a tufted but not knotted base, 6 to 9 in. high, slender, somewhat flattened, striate. Leaves at the base of the stem much shorter, very narrow, almost subulate, the sheathing bases open, with more or less scarious margins. Flower-head ovoid-oblong, dark coloured, the outer involucral bract erect, produced into a subulate leafy point often flexuose and several inches long, the second with a short point, the inner ones more glume-like. Spikelets sessile and densely crowded, narrow-lanceolate, 6 to 8 lines long, with about 5 flowers. Glumes lanceolate, acutely acuminate, the outer ones gradually shorter but only 1 empty. Hypogynous bristles 6, ciliate especially towards the base, about as long as the nut. Stamens 3. Nut obovoid, very obtuse, rugose.—*Chætospora compressa,* Nees in Pl. Preiss. ii. 85; Bœckel. in Linnæa, xxxviii. 291; F. Muell. Fragm. ix. 37.

W. Australia. Swan River, *Drummond, 1st coll. and n.* 906; *Preiss, n.* 1782.

3. **S. lanatus,** *Labill. Pl. Nov. Holl.* i. 19, *t.* 20.—Stems slender, 6 to 9 in. high. Leaves shorter, at the base of the stem, subulate, the sheaths bearded at the orifice with woolly hairs. Spikelets few, in an oblong terminal head or cluster, within black involucral bracts, the lowest and sometimes the next also produced into a long erect subulate lamina, the sheathing base woolly at the orifice. Spikelets narrow,

acute, 5 or 6 lines long, with 2 flowers. Glumes brown, woolly on the margins, the flowering ones obtuse, about 4 outer ones empty, gradually shorter and acuminate. Hypogynous bristles 6, longer than the nut, plumose with long hairs. Stamens 3. Nut ovoid, obtuse, but not seen ripe.—*Chætospora lanata*, R. Br. Prod. 232 ; Nees in Pl. Preiss. ii. 84; F. Muell. Fragm. ix. 37.

W. Australia. King George's Sound, *R. Brown ;* Swan River, *Drummond*, 1*st coll.*, *Preiss*, *n*. 1792.

SERIES II. SPHÆROCEPHALÆ.—Spikelets 1 to 3 lines long, very numerous and sessile in a globular or broadly turbinate head, with spreading subulate involucral bracts. Hypogynous bristles rarely deficient. Leaves tufted at the base of the stem.

4. **S. curvifolius,** *Benth.*—Stems slender, terete, rarely above 1 ft. high. Leaves shorter, densely tufted at the base of the stem, subulate, often curved or flexuose, the sheathing base often bordered by a hyaline membrane. Flower-head globular, 4 to 6 lines diameter. Involucral bracts ovate or ovate-lanceolate, bordered by a hyaline membrane and the outer ones produced into spreading flexuose subulate laminæ of ½ to 1 in. Spikelets very numerous, about 3 lines long, dark brown or black, with 1 or 2 flowers. Flowering glumes lanceolate, acute, almost entirely membranous; outer empty glumes about 5, gradually shorter, more acute or aristate, and 1 or 2 lowest setaceous almost from the base. Hypogynous bristles 6, scarcely longer than the nut, flat and ciliate. Stamens 3. Nut obovoid, obtuse, tuberculate or hispid at the top.—*Chætospora curvifolia*, R. Br. Prod. 232 ; Nees in Pl. Preiss. ii. 84; F. Muell. Fragm. ix. 36; *Chætospora aurata*, Nees in. Ann. Nat. Hist. ser. 1, vi. 49.

W. Australia. King George's Sound, *R. Brown*, *Oldfield*, *Maxwell*, *F. Mueller*. and thence to Swan River, *Drummond*, 1*st coll. and n*. 899, *Preiss*, *n*. 1773, 1777 and others.

5. **S. subbulbosus,** *Benth.*—Very much resembles *S. curvifolius*, but the stems are thickened and bulb-like at the base, the ligulæ of the old sheaths usually split up into long shreds or filaments, and the setaceous laminæ very short. Flower-heads globular, about ½ in. diameter. Involucral bracts few, subulate, incurved or flexuose, shorter than in *S. curvifolius* and much less dilated at the base. Spikelets very numerous, brown, about 3 lines long, with usually 3 flowers. Empty glumes 5 or 6 or even more, the outer ones setaceous almost from the base. Hypogynous bristles exceedingly short or here and there 1 or 2 longer than the nut and sometimes entirely deficient. Stamens 3. Nut obovoid, prominently 3-ribbed, tuberculate-hispid.—*Chætospora brevisetis*, F. Muell. Fragm. ix. 37, not of R. Br.; *Elynanthus capitatus*, Nees in Ann. Nat. Hist. ser. 1. vi. 48 ? from the character given.

W. Australia. Kalgan River, *F. Mueller ;* Forest Hill, *Muir ;* Swan River, *Drummond*, 1*st coll.*; Busselton, *Pries*.

Var. *junceus*. Stem above 1 ft. and often flattened. Leaves more rigid, without any or scarcely any scarious margin, but the old sheaths often split into shreds. Glumes minutely ciliate, the outer ones sometimes pubescent, the inner more obtuse than in the typical form.—W. Australia, *Drummond*, 1*st coll.*

6. **S. setifolius,** *Benth.*—Stems filiform, striate, above 1 ft. long, Leaves numerous at the base of the stem and almost as long, capillary, shortly dilated into brown closely imbricate sheaths. Flower-head globular, 4 to 5 lines diameter. Involucral bracts 2 or 3, subulate, spreading, slightly dilated and striate at the base, the bracts within the head glume-like but rigid and striate. Spikelets very numerous, sessile, narrow, about 2 lines long, with 2 or 3 flowers. Glumes acute or mucronate, keeled, striate, dark brown, only one empty outer one or even all flowering. No hypogynous bristles. Stamens 3. Nut ovoid, prominently 3-angled, smooth.

W. Australia. King George's Sound, *Menzies* (*Herb. Hook.*)

7. **S. Drummondii,** *Benth.*—Stems slender, 1 to 1½ ft. high. Leaves few, at the base of the stem, very much shorter, subulate, the sheaths glabrous. Flower-head globular, 3 to 4 lines diameter, and in one specimen a second head below the terminal one. Involucral bracts 2 or 3, subulate, spreading, sometimes very short, sometimes 1 to 3 in. long, slightly dilated at the base. Spikelets numerous, ovate, slightly compressed, a little more than 1 line long, with 2 flowers, but usually only 1 fertile. Glumes obtuse, 2 outer ones empty and shorter. Hypogynous bristles 6 or fewer, longer than the nut and ciliate with a few long hairs, or sometimes all very small. Stamens 3. Nut ovoid, prominently 3-angled, smooth and shining, at length very dark coloured or almost black.—*Chætospora nitens*, var. ? R. Br. Herb.; *C. microstachya*, Nees in Pl. Preiss. ii. 84; Bœckel. in Linnæa, xxxviii. 295; F. Muell. Fragm. ix. 37 (a name preoccupied in *Schœnus*); *Gymnochæte Drummondi*, Steud. Syn. Glum. ii. 156.

W. Australia. King George's Sound and adjoining districts, *R. Brown*, *Drummond*, *n.* 114, 333, *F. Mueller*.

The spikelets are nearly those of *S. nitens*, but much smaller, very much more numerous, in a terminal head with several bracts, not thrown to one side by the single bract.

8. **S. turbinatus,** *Benth.*—Stems slender, angular or compressed, rarely above 1 ft. high. Leaves at the base of the stem much shorter, subulate, the sheaths either scarious on the margin or at length split into filaments. Flower-head ovoid or turbinate, usually about ½ in. long. Involucral bracts 3 or more, lanceolate at the base, with a subulate point or lamina, the longest often attaining 2 or 3 in. Spikelets numerous, sessile, linear-lanceolate, flattened, about 3 lines long, with 1 perfect flower. Glumes lanceolate, acutely acuminate, usually ciliate, 3 or 4 outer empty ones gradually shorter and more aristate, the empty glume above the flower stipitate. Hypogynous bristles 6, rigid, rather longer than the nut, ciliate especially below the middle. Stamens 3. Nut obovoid, prominently 3-ribbed, minutely granular;

rugose.—*Chætospora turbinata,* R. Br. Prod. 232, Bœckel. in Linnæa, xxxviii. 293, F. Muell. Fragm. ix. 33; Sieb. Agrostoth. n. 31.

N. S. Wales. Port Jackson, *R. Brown, U. S. Exploring Expedition, F. Mueller,* and many others.

Series III. Isoschœneæ.—Spikelets in a single terminal head, but either few in the head, sometimes only 2 or 3, or if numerous spreading, or the head loose. Hypogynous bristles none or very short.—*Isoschœnus,* Nees.

9. **S. barbatus,** *Bœckel. in Linnæa,* xxxviii. 277.—Very closely allied to *S. flavus,* and probably a variety only, the stems more slender, 2 to 6 in. high. Leaves subulate, densely bearded at the orifice of the sheath. Flower-heads narrower than in *S. flavus,* consisting usually of 2 to 4 spikelets, the broad base of the involucral bract densely bearded on the margin, the glumes slightly so.—F. Muell. Fragm. ix. 30; *Isoschœnus barbatus,* Nees in Pl. Preiss. ii. 80.

W. Australia. Princess Royal Harbour, *Preiss, n.* 1732; Stirling Range, *F. Mueller.*

10. **S. flavus,** *Bœckel. in Linnæa,* xxxviii. 278.—Densely tufted. Stems rigid, under 6 in. high, minutely pubescent or rarely quite glabrous. Leaves at the base of the stem and often as long, very narrow or almost subulate, acute, rigid, flexuose, the sheaths bordered at the orifice by a hyaline membrane often slightly ciliate. Flower-head oblong or broad, with few or many spikelets. Involucral bracts 2 or 3 longer than the head, the short broad base bordered by a hyaline membrane, the leaflike lamina rigid but curved; inner bracts glumlike but mostly with a green keel. Spikelets lanceolate, brown, 4 to 5 lines long, more or less flattened, with about 3 flowers. Glumes thinly membranous, acute, 2 or 3 outer empty ones shorter. No hypogynous bristles. Stamens 3. Nut ovoid, 3-ribbed, tuberculate-rugose.—F. Muell. Fragm. ix. 30; *Isoschœnus flavus,* Nees in Ann. Nat. Hist. ser. 1. vi. 49, and in Pl. Preiss. ii. 80; *Isoschœnus Drummondii,* Steud. Syn. Glum. ii. 167.

W. Australia. Swan River, *Drummond 1st coll. and n.* 332, 898; *Preiss, n.* 1774.

11. **S. brevisetis,** *Benth.*—Stems 6 in. to near 1 ft. high. Leaves at the base of the stem 3 to 4 in. long, subulate, rigid, the black sheaths densely bearded at the orifice. Flower-head or cluster oblong, with 2 to 4 spikelets. Outer involucral bract erect, rigid, subulate, 1 to 2 in. long, the second short, the sheaths or dilated base bearded. Spikelets sessile, lanceolate, 5 to 6 lines long, with 2 flowers. Glumes rather obtuse or the outer ones acute or acuminate, woolly-ciliate on the margin, 5 or 6 outer empty ones gradually shorter. Hypogynous bristles much shorter than the nut and sometimes very minute, flat and ciliate at the base. Stamens 3. Nut obovoid, slightly 3-ribbed, smooth or nearly so.—*Chætospora brevisetis,* R. Br. Prod. 232.

W. Australia. King George's Sound, *R. Brown;* Point Henry, *Oldfield;* Perongerup, *F. Mueller.*

Var. *subimberbis.* Glumes very slightly fringed or quite glabrous.—*Schœnus flaviculmis* (partly), Nees in Pl. Preiss. ii. 81; F. Muell. Fragm. ix. 30; *S. cygneus*, Nees, l. c., but not the *Chætospora cygnea*, Nees, in Ann. Nat. Hist. ser. 1. vi. 49.—Swan River, *Preiss, n.* 1795: *Drummond, n.* 910, *Miss Lukin.*

Though sometimes this has almost the aspect of *S. pedicellatus*, it is readily distinguished by the spikelets closely sessile. In this and some other species the uppermost flowering glume and summit of the rhachis are often swollen into a globular densely villous mass, but perhaps through disease, as the enclosed nut is generally deformed.

12. **S. armeria,** *Bœckel. in Linnæa*, xxxviii. 279.—Stems densely tufted, slender, mostly 9 in. to 1 ft. high, leafless except 1 or 2 sheathing scales at the base with a short subulate lamina, the orifice of the sheath crowned by a brown or hyaline membrane. Flower-head or cluster about ½ in. diameter, the bracts all short, or 1 or 2 outer ones produced into a point rather longer than the head. Spikelets rather numerous, sessile, narrow-lanceolate, slightly compressed, dark brown, 3 to 4 lines long, with 2 flowers. Glumes acute or the outer ones mucronate, glabrous or minutely pubescent, the margins not fringed, 3 or 4 outer empty ones gradually shorter. No hypogynous bristles. Stamens 3. Nut small, obovoid or almost globular, obscurely 3-angled scarcely rugose.—F. Muell. Fragm. ix. 30: *Isoschœnus armeria,* Nees in Ann. Nat. Hist. ser. 1. vi. 49 and in Pl. Preiss. ii. 80.

W. Australia. Swan River, *Drummond,* 1*st coll. and n.* 999, Darling Range, *Preiss, n.* 1755; Stirling Range, *F. Mueller.*

13. **S. aphyllus,** *Bœckel. in Linnæa*, xxxviii.' 280.—Stems tufted, slender, 6 to 10 in. high, leafless except rigid brown sheathing scales at the base, glabrous at the orifice, and tapering into short erect points. Flower-head terminal or rarely slightly lateral. Involucral bracts shorter than the head or rarely 1 rather longer and erect. Spikelets rather numerous, brown, ovate-lanceolate, about 2 lines long, with 2 flowers. Glumes broad, acute, 3 or 4 outer ones empty and gradually shorter. No hypogynous bristles. Stamens 4 to 6 or very rarely 3. Nut obovoid, obtuse, obscurely 3-angled, smooth.—F. Muell, Fragm. ix. 28.

Victoria. On the Murray River, near the Golgol, *F. Mueller.* Very closely allied to *S. imberbis,* but more rigid, the sheathing scale at the base of the stem broader and deeply coloured, the spikelets more numerous in a denser though smaller head and not so black, the stamens almost always more than three.

14. **S. imberbis,** *R. Br. Prod.* 231.—Stems slender, densely tufted, 6 in. to above 1 ft. high, leafless except brown sheathing scales at the base, oblique at the orifice, glabrous or minutely ciliate and usually with a linear or subulate lamina of a few lines. Flower-head or cluster solitary, terminal or rarely slightly lateral, sometimes rather loose and about ½ in. diameter. Involucral bracts shorter than the head or rarely one rather longer and erect. Spikelets 6 to 20 in the head, narrow-lanceolate, black, straight or slightly falcate, about 3 lines long,

with 2 flowers. Glumes obtuse or the outer ones acute, shortly ciliate towards the end or quite glabrous, 3 to 5 outer ones empty and gradually shorter. No hypogynous bristles. Stamens 3. Nut obovoid, very obtuse or retuse, obtusely 3-angled but scarcely ribbed, rugose.—F. Muell. Fragm. ix. 28; Sieb. Agrostoth. n. 30.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown; Leichhardt, Woolls* and others; southward to Illawarra, *A. Cunningham*, and granite rocks on the Wombayne River, *F. Mueller.*

15. **S. ericetorum,** *R. Br. Prod.* 231.—Closely resembles *S. imberbis* in every respect, except that the brown leaf-sheaths at the base of the stem are bearded at the orifice with short woolly hairs, the heads of spikelets rather looser sometimes forming a small corymb, with 1 or 2 lateral clusters on peduncles of 2 or 3 lines, but often quite as compact as in *S. imberbis*. Spikelets black, lanceolate, fully 3 lines long, rather more curved and acuminate than in *S. imberbis*, with 2 flowers as in that species, but the glumes often more numerous, 6 or 7 outer ones empty. No hypogynous bristles. Stamens and nut of *S. imberbis*.—Sieb. Agrostoth. n. 45; F. Muell. Fragm. ix. 28; Bœckel. in Linnæa, xxxviii. 278.

N. S. Wales. Port Jackson, *R. Brown, F. Mueller, C. Moore* and many others; Newcastle, *Leichhardt.*

W. Australian specimens from *Drummond* in herb. Hook. very much resemble the *S. ericetorum*, but the spikelets are in too imperfect a state to verify their structure.

SERIES IV. LATERALES.—Spikelets not above 2 lines long, in a single lateral head or cluster or rarely solitary, the erect involucral bract continuing the stem. Hypogynous bristles present, ciliate.

Owing to the bract subtending the spikelet being readily taken for one of the glumes, the few empty glumes and the very broad flowering ones enveloping each other, they appear at first sight not to be distichous, but the flexuose zigzag rhachis with the centre of the scar of each glume regularly on alternate sides show that the arrangement is really that of other *Schœni*, and not imbricate all round as in *Scirpus*, to which Bœckeler has transferred the *S. nitens.*

16. **S. nitens,** *Hook. f. Handb. N. Zeal. Fl.* 299.—Stems from a creeping rhizome slender, from an inch or two to 1 ft. high. Leaves few at the base of the stem, short, terete but furrowed along the inner side, the sheaths not bearded. Involucral bract erect, continuing the stem to ½ to 1½ in. beyond the inflorescence. Spikelets in a sessile cluster of 2 to 6 or solitary, apparently lateral, from ovoid to ovoid-lanceolate, 1½ to 2 lines long, with 2 flowers and a normally flexuose rhachis. Glumes broad, obtuse, not so distinctly distichous as in most species though the insertion is really the same, 2 or rarely 3 outer empty ones shorter. Hypogynous bristles 6, rather longer than the nut, ciliate at the base with long hairs. Stamens 3. Nut ovoid, prominently 3-angled, smooth and shining.—*Chætospora nitens*, R. Br. Prod. 233, Hook. f. Fl. Tasm. ii. 82, F. Muell. Fragm. ix. 35; *Scirpus nitens*, Bœckel. in Linnæa, xxxvi. 696.

Queensland. Moreton Island, *M'Gillivray.*

Victoria. Maritime pastures from Melbourne to Gipps' Land, *F. Mueller*, *Adamson* and others.

Tasmania. Port Dalrymple and Kent's Group, Bass's Straits, *R. Brown;* sand hills, north coast, *Gunn* and others.

S. Australia. Port Lincoln, *R. Brown;* Spencer's Gulf, *F. Mueller.*

W. Australia. King George's Sound, *R. Brown;* also *Drummond, n.* 385.

The species is also in New Zealand, and apparently the same in extra-tropical South America.

17. **S. cygneus,** *Nees in Pl. Preiss.* ii. 81 (as to the syn.).—Stems very slender, 6 to 9 in. high. Leaves at the base of the stem short, subulate, the sheaths bearded at the orifice, the older outer ones dark brown and rigid. Involucral bract subulate, continuing the stem ½ to 1½ in. beyond the inflorescence. Spikelets 2 or 3 together or rarely solitary, sessile and apparently lateral, lanceolate, not much flattened, dark brown or black, 1½ to 2 lines long, with usually 2 flowers. Glumes very acute or mucronate, scarcely fringed or quite glabrous, about 4 outer empty ones of which 2 or 3 short. Hypogynous bristles or scales 6, very short, flat, hyaline and deeply divided. Stamens 3. Nut obovoid, slightly 3-ribbed, smooth or nearly so.—Bœckel. in Linnæa, xxxviii. 276; *Chætospora cygnea,* Nees in Ann. Nat. Hist. ser. 1, vi. 49, but not the plant described in Pl. Preiss. ii. 81.

W. Australia. Swan River, *Drummond, 1st coll.*

In this and some other species the small bristles deeply divided into or fringed by long cilia have been sometimes described as hairs on the torus.

Series V. Oligostachyæ.—Dwarf plants or rarely above 6 in. Spikelets solitary or 2 very rarely 3 or 4 together, all terminal and erect. Hypogynous bristles none or when present some or all very short.

18. **S. minutulus,** *F. Muell. Fragm.* ix. 32.—A dwarf but densely tufted perennial. Stems rather rigid, 1 to 2 in. high, leafless except broad brown sheathing scales at the base, sometimes produced into a short subulate lamina. Spikelets terminal, erect, solitary or 2 together, the subtending bract with a leafy point shorter or longer than the spikelet, the spikelet scarcely 2 lines long, lanceolate, brown, with 2 flowers. Glumes obtuse or the inner ones membranous at the top, about 3 outer empty ones gradually shorter. No hypogynous bristles. Stamens 6 (or 3 only *F. Mueller*). Nut small, ovoid, obtuse, seated on a thick raised torus, minutely granular, but not seen quite ripe.

W. Australia. *Drummond.*

19. **S. trachycarpus,** *F. Muell. Fragm.* ix. 33.—A dwarf densely tufted perennial. Stems subulate, 2 to 3 in. high. Leaves at the base subulate and stemlike and often longer than the stem, with rather long sheaths. Spikelets terminal, erect, solitary or 2 together, sessile within 2 erect subulate leafy bracts, one of them often above 1 in. long, the other much shorter. Spikelet about 2 lines long, very flat, with 2 or 3 flowers. Glumes obtuse, dark brown with light-coloured or hyaline margins, about 4 outer empty ones gradually rather shorter. Bristles and stamens not seen. Nut ovoid, 3-angled, tubercular-rugose, seated on a short stipes.

W. Australia. *Drummond, n.* 336. The spikelets in Drummond's specimens are either very young or old and injured, and some of the above characters may require modification from more perfect specimens.

20. **S. nanus,** *Benth.*—Dwarf and densely tufted but perhaps annual. Stems ¾ to 1½ in. high. Leaves radical, filiform, shorter than the stem. Spikelets terminal, erect, 2 to 4 together, sessile or very shortly pedicellate between 2 involucral bracts, 1 often longer than the inflorescence. Spikelets narrow-lanceolate, flattened, 3 to 3½ lines long, with 4 to 5 flowers. Outer glumes gradually shorter, but usually only the lowest one empty. Hypogynous bristles 6, shorter than the nut or 1 or 2 longer, very shortly ciliate, not plumose. Stamens 3. Nut obovoid-globular, the ribs scarcely prominent, obtuse, tubercular-rugose.—*Chætospora nana,* Nees in Pl. Preiss. ii. 85; Bœckel. in Linnæa, xxxviii. 298.

W. Australia. Mount Elphinstone, *Preiss, n.* 1753; N. of Stirling Range, *F. Mueller.*

21. **S. pleiostemoneus,** *F. Muell. Fragm.* ix. 52.—Stems filiform, 3 to 6 in. high, leafless except a brown slender sheath at the base, oblique at the orifice and tapering into a short erect point. Spikelet solitary, terminal, erect, the subtending bract glumelike but tapering into a short point, the spikelet lanceolate, flattened, about 4 lines long, with 3 or 4 flowers. Glumes membranous, brown, acute, 1 or sometimes 2 outer ones empty and shorter. No hypogynous bristles. Stamens 4 to 6. Nut small, obovoid, 3-ribbed, tubercular-rugose, but not seen quite ripe.

W. Australia. Putingup, north of Stirling Range, *Maxwell.*

22. **S. breviculmis,** *Benth.*—A dwarf densely tufted perennial. Stems when in flower shorter than the spikelets and rarely 1 in. long when in fruit. Leaves much longer, attaining 4 to 5 in., very narrow, flat or subulate, dilated at the base into a short open sheath, the outer leaves often reduced to linear acute scales. Spikelets 2 (sometimes 1 or 3?), erect, with 1 long leafy bract under the lower one and usually 2 under the upper one, the 2 spikelets close together, 6 to 7 lines long, with 3 to 5 flowers. Glumes narrow, thinly membranous almost hyaline, with a prominent acute keel, and no outer empty ones besides the subtending bract. No hypogynous bristles. Stamens 3, with long anthers. Nut nearly globular, slightly 3-angled, tuberculate and often minutely hispid.

W. Australia, *Drummond.*

23. **S. deformis,** *R. Br. Herb.*—Stems densely tufted, 2 to 5 in. long, mostly curved. Leaves at the base of the stem with sheaths densely bearded at the orifice and short subulate laminæ with fine recurved points. Spikelet solitary and terminal, erect and sessile within the sheath of an erect subulate small bract, dark brown, narrow-lanceo-

late, scarcely flattened, about 5 lines long, with 3 or 4 flowers. Glumes narrow, scarcely acute, slightly fringed with short hairs, the outer ones more acuminate but apparently only one empty. Hypogynous bristles 6, densely hairy. Stamens 3.—*Chætospora deformis*, R. Br. Prod. 232.

S. Australia. Memory Cove, *R. Brown.* The specimens are few and not in a satisfactory state, but certainly cannot be referred to any other known species.

24. **S. unispiculatus,** *F. Muell. Herb.*—Stems from 6 to 9 in. high, rather rigid and striate. Leaves at the base of the stem much shorter, rigid, striate, sometimes flat and nearly 1 line broad, sometimes almost subulate, the young ones often clothed with a loose cottony wool, the old ones or rarely all glabrous, the sheaths bearded at the orifice with rather long hairs. Spikelet solitary and terminal or rarely with a second lower down, erect, 1 in. long or rather more, linear-lanceolate, somewhat flattened, with 2 or 3 flowers. Sheathing bract at the base and sometimes the lower glumes produced into a short leaflike point or lamina. Glumes all obtuse or scarcely acute, fringed at the apex, 2 or rarely 3 outer ones empty and shorter. Hypogynous bristles few, sometimes 1 or 2 longer than the ovary and plumose, the others and sometimes all very short. Stamens 3. Nut obovoid, but not seen ripe. —*Chætospora deformis*, F. Muell. Fragm. ix. 39, not of R. Br.

W. Australia. Swan River, *Drummond*, 1*st coll. and n.* 895, 896.

25. **S. tenuissimus,** *Benth.*—Stems from a creeping rhizome very slender or filiform, from a few inches to 1 ft. high or rather more, slightly angular, leafless except sheathing scales at the base oblique at the orifice and produced into a very short point. Spikelets solitary and terminal, erect, linear-lanceolate, flat, 5 to 6 lines long in the southern specimens, 6 to 8 lines in the Port Jackson ones, with 1 perfect flower and a second sterile one or empty glume above it. Glumes obtuse, slightly scarious at the end, 3 or 4 outer empty ones gradually shorter, besides the still shorter subtending glume-like bract. Hypogynous scales 6, small at the time of flowering, longer and acuminate under the fruit. Stamens 3. Style distinctly thickened at the base but articulate on the nut and deciduous. Nut obovoid, obtuse, smooth.—*Chætospora tenuissima*, Hook. f. Fl. Tasm. ii. 81, t. 140 B; F. Muell. Fragm. ix. 33.

N. S. Wales. Port Jackson, *C. Moore.*
Victoria. Near Brighton, Mount Imlay and Wilson's Promontory, *F. Mueller.*
Tasmania. Moist sandy places near Hobarton, *Gunn*; South Port, *Story*; near Circular Head, *F. Mueller.*

The hypogynous scales are very nearly those of *Lepidosperma*, though not quite so thick, the other characters are entirely those of *Schœnus*. The rhachis of the spikelets as in the other species is short and thick between the empty glumes, which leave annual scars, much elongated and curved above the fertile flower, bearing at its extremity the terminal barren flower or empty glume.

SERIES VI. STRICTÆ.—Leaves usually long. Spikelets erect or on erect peduncles, in a narrow almost spikelike panicle, the lower flowering sheaths often distant. No hypogynous bristles. Stamens 3.

26. **S. obtusifolius,** *Bœckel. in Linnæa*, xxxviii. 281.—Stems rigid, 3 to 6 in. high, slightly compressed. Leaves at the base of the stem much shorter, erect, rigid, obtuse, concave, ½ to 1 line broad, not ribbed, the dark brown sheath bordered at the top by a hyaline membrane and not bearded. Panicle simple, narrow and spikelike, but interrupted. Outer bracts rather distant, with dark brown almost black sheaths, bordered upwards by a scarious membrane, the lower ones produced into a rigid leaflike obtuse lamina, the upper into a short point. Spikelets usually 2 in each bract, on unequal pedicels, very erect, narrow, flat, 5 to 6 lines long, brown, usually with 2 flowers. Glumes rigid, acute or almost obtuse, only 1 outer empty one rather shorter and more acute than the flowering ones. No hypogynous bristles. Stamens 3. Nut not seen ripe.—F. Muell. Fragm. ix. 31; *Elynanthus obtusifolius*, Nees in Pl. Preiss. ii. 78.

W. Australia. Princess Royal Harbour, *Preiss, n.* 1824; Upper Kalgan River, *F. Mueller;* between Esperance Bay and Fraser's Range, *Dempster*.

27. **S. grammatophyllus,** *F. Muell. Fragm.* ix. 31.—Stems 6 in. to 1 ft. high, slender but striate. Leaves at the base of the stem shorter, erect, rigid, flat, ½ to ¾ line broad, with 2 or 3 prominent longitudinal ribs on each side, the sheaths bordered upwards by a hyaline membrane and slightly bearded at the orifice. Panicle simple, narrow and spikelike but interrupted at the base, 3 to 6 in. long. Outer bracts rather distant, with short dark brown or black sheaths, bordered upwards by a scarious or hyaline membrane and slightly bearded at the orifice, the lower ones produced into a leaflike lamina, the upper into a short point. Spikelets 2 in each sheath on unequal pedicels or rarely 2 on the longer pedicel, all very erect, narrow, 5 to 6 lines long, with 2 or 3 flowers. Glumes acutely acuminate, glabrous, only 1 outer empty one scarcely shorter. No hypogynous bristles. Stamens 3. Nut shortly obovoid, 3-angled, nearly smooth.

W. Australia, *Drummond, n.* 85 *and* 94.

28. **S. asperocarpus,** *F. Muell. Fragm.* ix. 29.—Stems slender, striate, 9 in. to 1½ ft. high. Leaves at the base of the stem much shorter, terete and stemlike but dilated at the base into rather long sheaths. Panicle long and narrow, the branches few and erect, two or three together very unequal in the lower bracts. Lower bracts distant, subulate and leaflike with brown sheaths dilated and open upwards, the upper bracts reduced to the brown sheaths. Spikelets few on the branches, erect and sessile, narrow, slightly flattened, 4 to 5 lines long, with 3 or 4 flowers. Glumes narrow, rigid, acute or mucronate, with only one outer empty one rather shorter, or none besides the subtending bract. No hypogynous bristles. Stamens 3. Nut obovoid, prominently 3-ribbed and transversely tuberculate-rugose.

W. Australia, *Drummond* 1*st coll. and n.* 913.

29. **S. Moorei,** *Benth.*—Nearly allied to *S. villosus*, but the inflorescence not so dense and quite glabrous, and the glumes fewer. Stems slender, terete, striate, 6 to 9 in. long. Leaves at the base of the stem shorter, very narrow, almost subulate, the inner surface concave, not ribbed, the sheaths not bearded. Panicle narrow, almost spikelike, the spikelets very few in each sheath and nearly sessile, or in the lower sheath an erect peduncle or branch with 2 or three spikelets. Sheathing bracts distant, with long subulate laminæ. Spikelets at first about 4 lines long, but fully 5 when in fruit, with 2 to 4 flowers. Glumes almost obtuse, only 1 or 2 outer ones empty, shorter, and more acute. No hypogynous bristles. Stamens 3. Nut ovoid, faintly 3-ribbed.

N. S. Wales. Port Jackson, *C. Moore*, *Vicary*. The latter specimens just coming into flower have the glumes rather rigid and the outer ones almost black. In Moore's with old spikelets in fruit, the glumes are all very thin, pale, and almost hyaline, but both appear to belong to the same species. In a specimen from Herb. Mus. Par. in herb. DC. the inflorescence is almost contracted into a head, but it appears also to belong to the same species.

30. **S. villosus,** *R. Br. Prod.* 231.—Stems densely tufted, rigid, slightly angular, about 1 ft. high. Leaves at the base of the stem much shorter, very narrow but flat, rigid, prominently 2- or 3-nerved on each face, the black sheaths short and woolly at the orifice, and 1 or 2 stem-leaves with longer 3-nerved sheaths and shorter laminæ passing into the floral bracts. Spikelets in dense clusters or secondary spikes, the upper ones forming an oblong spike of 1 to 1½ in., the lower ones in more distant axillary clusters or secondary spikes; the spikelets acuminate, 4 to 5 lines long, with 2 or 3 flowers. Glumes lanceolate, acute, densely bearded on the margin, 3 or 4 outer ones empty, shorter and more acuminate. No hypogynous bristles. Stamens 3. Nut not seen.—Bœckel. in Linnæa, xxxviii. 285; F. Muell. Fragm. ix. 28; *Chætospora villosa*, Nees in Sieb. Agrostoth. n. 26.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls* and others.

31. **S. grandiflorus,** *F. Muell. Fragm.* ix. 30.—Stems from a short almost bulbous base, stout, leafy, 2 ft. high or more. Leaves much shorter, often 4 to 5 lines broad, tapering to a point, the lower ones with short sheaths open almost to the base, those on the stem with closed sheaths ending in a short broad membrane or ligula, the floral leaves or bracts gradually narrower and shorter. Panicle narrow, leafy, often above 1 ft. long, with rather numerous axillary clusters or short partial panicles. Spikelets narrow-lanceolate, flat, brown, 8 to 9 lines long, with 2 to 4 flowers. Glumes very acute, not fringed, 8 to 10 outer ones empty and gradually shorter. No hypogynous bristles. Stamens 3. Nut narrow-obovoid, obtuse, nearly 2 lines long, obscurely 3-ribbed, quite smooth.—*Elynanthus grandiflorus*, Nees in Pl. Preiss. ii. 78.

W. Australia. Swan River, *Drummond*, 1*st coll.*, *Preiss*, n. 1781; Point Henry and Murchison River, *Oldfield*; Lakes and swamps near Putingup, *F. Mueller*. The style and the nut, though large, are quite those of *Schœnus* and not of *Elynanthus*; the spikelets are those of the *Calostachyæ*, but crowded in the axils of the floral leafy bracts.

Series VII. Calostachyæ.—Spikelets large (except in *S. acuminatus*), pedicellate in distant sheaths, solitary or very few in each sheath. Outer empty glumes usually numerous, regularly distichous. Stamens 3.

32. **S. calostachyus**, *Benth.*—Stems 1 to 2 ft. high or more, rigid. Leaves at the base of the stem long, rigid, very narrow, with a prominent keel and slightly scabrous margins, the open sheaths bordered by a hyaline membrane slightly ciliate at the top, and sometimes 1 or 2 leaves on the stem with longer closed sheaths and shorter lamina. Floral leaves or bracts similar, but gradually smaller and all very distant. Spikelets solitary or 2 in each sheath, on very unequal peduncles, and sometimes a second spikelet on one of the lower ones, the spikelets narrow-lanceolate, flat, dark brown in the typical form, about 1 in. long when fully out, with 3 to 5 flowers. Glumes acute, rigid, shortly ciliate on the edge, 4 to 6 outer ones empty and gradually shorter, the lowest very short. Hypogynous bristles 4 to 6, much shorter than the nut or 1 or 2 of them longer. Stamens 3. Nut narrow-ovoid, 3-angled, prominently tuberculate almost muricate.—*Chætospora calostachya*, R. Br. Prod. 233.

Queensland. Endeavour River, *Banks and Solander*; Moreton Island, *M'Gillivray*.

N. S. Wales. Hastings River, *Beckler*.

Var. *distans*. Leaves rather shorter and none on the stem below the floral ones. Spikelets paler coloured, but I can find no other difference.—*Chætospora distans*, F. Muell. Fragm. iv. 35.

W. Australia. Murchison River, *Oldfield*; Busselton, *Pries*.

33. **S. scabripes**, *Benth.*—Stems 2 ft. high or more, somewhat flattened and grooved, leafless except a few long distant brown sheaths shortly woolly at the orifice, with very short erect obtuse points. Flowering sheaths similar but shorter, all distant. Peduncles 2 or 3 from each sheath, slender but rigid and very scabrous, all erect with a single erect spikelet or one from the lowest bract elongated with 2 or 3 spikelets. Spikelets narrow, acuminate, slightly flattened, ¾ in. long or perhaps rather more when fully out, with 1 or 2 flowers. Flowering glume acuminate but rather obtuse, outer empty ones 5 or 6 gradually shorter, all obtuse with an obtuse glandlike point. No hypogynous bristles. Stamens 3, with very long anthers. Nut not seen.

Queensland. Moreton Island, *F. Mueller*. Evidently very near to *S. calostachyus* and *S. efoliatus*, but distinct from both. The spikelets are, however, scarcely fully developed in the specimens seen.

34. **S. multiglumis**, *Benth.*—Very near *S. efoliatus* and included

in it by *F. Mueller*, but the stems taller and stouter, attaining 3 to 4 ft. much compressed or grooved on one side, the sheathing scales at the base and the sheathing bracts with small obtuse points as in *S. scabripes*. Spikelets generally 2 only within the uppermost bract, and 2 in a sheathing bract much lower down, the peduncles unequal, slender, rigid but smooth. Spikelets narrow and acute, scarcely compressed, ¾ to 1 in. long though scarcely fully out, with 2 flowers. Glumes obtuse with short obtuse glandlike points as in *S. scabripes*, but about 10 to 12 outer ones empty and gradually shorter. No hypogynous bristles. Stamens 3. Nut not seen.

W. Australia. King George's Sound, *Oldfield*; Albany, *F. Mueller*.

35. **S. efoliatus,** *F. Muell. Fragm.* ix. 32.—Stems rather slender, rushlike, terete and slightly striate, 1 to 2 ft. high, leafless except the close-sheathing scales at the base with very short obtuse erect points, the sheathing floral bracts distant, narrow, with very short or without any points. Peduncles 2 or 3 together in each bract, long filiform and erect, sometimes very long, each with 1 or 2 spikelets. Spikelets all erect, very narrow lanceolate, acute, rather flat, 6 to 8 lines long, with usually 2 flowers. Glumes rigid, very acute, 5 or 6 outer empty ones gradually shorter, the lowest 2 very short. No hypogynous bristles. Stamens 3. Nut obovoid, obtusely 3-angled, smooth.

W. Australia. King George's Sound and Stirling Range, *F. Mueller*; Kalgan River, *Oldfield*.

36. **S. acuminatus,** *R. Br. Prod.* 231.—Stems slender, 1 to 1½ ft. long, leafless except a few distant close sheaths along the stem with narrow-linear erect laminæ of ½ to 1 in., the basal sheaths with only very short points; the floral sheathing bracts similar, distant. Spikelets solitary or 2 together on unequal peduncles within the sheaths, lanceolate, acute, flat, 4 to 5 lines long, with usually 2 flowers. Glumes acute, with whitish margins, not ciliate, about 5 outer empty ones gradually shorter. No hypogynous bristles. Nut (a loose one in herb. Br.) obovoid-oblong, very obtuse, obtusely 3-angled at the base, quite smooth.

W. Australia. King George's Sound, *R. Brown*.

SERIES VIII. PANICULATÆ.—Spikelets under ½ in. long, usually dark brown or black, often falcate, all pedunculate, either numerous in a panicle usually secund, or few in a terminal cluster.

37. **S. pedicellatus,** *Benth.*—Stems 1 to 1½ ft. high, rigid but often slender, leafless except short brown or black sheaths at the base, bearded at the orifice, and often bearing a subulate or terete lamina of ½ to 2 in. Spikelets few in a terminal cluster and frequently another cluster a little lower down, in the axils of very short bracts, all distinctly pedicellate, linear-lanceolate, often falcate, slightly compressed, dark brown, 5 to 6 lines long, with 3 to 6 flowers. Glumes ciliate on

the margins, about 5 outer empty ones gradually shorter. Hypogynous bristles 6 or fewer, very unequal, one frequently as long as the nut but mostly shorter, and sometimes all very minute. Stamens 3. Nut ovoid, about 1 line or longer, obtusely 3-angled, smooth.—*Chætospora pedicellata*, R. Pr. Prod. 232; *Schœnus fascicularis*, Nees in Pl. Preiss. ii. 82, but not the plant described in Ann. Nat. Hist. ser. 1, vi. 48.

W. Australia. King George's Sound, *R. Brown;* Swan River, *Preiss, n.* 1802, also *Drummond, 1st coll. and n.* 105, 911, 912.

This and the following two species appear to pass almost gradually into the *S. melanostachyus*, but can scarcely be united with it as varieties.

38. **S. fascicularis,** *Nees in Ann. Nat. Hist. ser.* 1, vi. 48, *not of Pl. Preiss.*—Stems 1½ to 2 ft. high, terete or grooved on one side, leafless except the dark brown rigid shining sheaths at the base, of which the inner one is often 2 in. long, bearded at the orifice, and bearing an erect subulate point of 1 to 2 or rarely 3 lines. Panicle terminal, narrow, dense, turned to one side, 1 to 2 in. long. Spikelets clustered, but all or most of them very shortly pedicellate, narrow, mostly falcate, slightly compressed, dark brown, 4 to near 5 lines long, with 2 or 3 flowers. Glumes scarcely ciliate, 5 or 6 outer empty ones gradually shorter. Hypogynous bristles none or rarely 1 short one. Stamens 3. Nut not seen.

W. Australia. Swan River, *Drummond, 1st. coll. and n.* 110.

39. **S. brevifolius,** *R. Br. Prod.* 231.—Stems from a creeping rhizome rushlike, 1 to 2 ft. high or more, leafless except the brown sheathing scales at the base, the innermost with a rigid erect point or lamina rarely 1 in. long, the orifice not bearded. Panicle rather loose but very narrow, 3 to 6 in. long or more, the spikelets almost clustered on short peduncles, the lower clusters distant, or the panicle rather more compound with the lower branches elongated. Sheathing bracts tapering into short erect points or laminæ. Spikelets linear-lanceolate, 5 lines long when full-grown, brown, not so much flattened as in *S. melanostachyus*, with 3 to 5 flowers. Glumes obtuse or nearly acute, 2 to 4 outer empty ones shorter and more obtuse. No hypogynous bristles. Stamens 3. Nut obovoid, scarcely rugose.—F. Muell. Fragm. x. 29; Sieb. Agrostoth. n. 7.

Queensland. Near Brisbane, *Bailey.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Woolls, C. Moore*, and others; Hastings River, *Beckler.*

Victoria. Port Phillip, *Luchmann;* near Brighton, *F. Mueller;* French Island, *Beveridge.*

S. Australia. *S. brachyphyllus*, F. Muell., from Mount Lofty Ranges, mentioned by F. Muell. Fragm. ix. 29, under *S. melanostachyus*, appears to me to be quite identical with *S. brevifolius.*

W. Australia. King George's Sound, *R. Brown;* Murchison River, *Oldfield;* also in *Drummond's* collection, n. 912.

40. **S. melanostachyus,** *R. Br. Prod.* 231.—Stems terete, usually

2 to 3 ft. high, but some specimens from various quarters marked as attaining 8 to 10 ft., leafless except a brown sheath at the base more or less bearded at the orifice, with a spreading obtuse rigid lamina of 1 to 3 lines. Panicle rather loose and often secund, oblong or thyrsoid, 3 to 6 in. long, the lower branches rather long. Sheathing bracts short, woolly at the orifice, with a small reflexed obtuse lamina. Spikelets all pedicellate, rather numerous, black, linear-lanceolate, flat, usually about 3 lines long but sometimes 4 lines, often slightly falcate, with 1, 2, or sometimes 3 flowers. Flowering glumes obtuse, about 4 outer empty ones gradually shorter and more acute. Hypogynous bristles either none or few and very short and unequal, rarely 1 as long as the nut. Stamens 3 or rarely 4. Nut obovoid, 3-ribbed, granular-tuberculate.—Bœckel. in Linnæa, xxxviii. 284; F. Muell. Fragm. ix. 29; Nees in Sieb. Agrostoth. n. 3.

Queensland. Rockingham Bay, *Dallachy;* Wide Bay, *Leichhardt;* Brisbane River, *Bailey.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Woolls,* and others; north of Bathurst, *A. Cunningham*; New England, *C. Stuart.*

W. Australia? Apparently the same species, King George's Sound, *A. Cunningham,* also *Drummond, n.* 111 *and* 368. These specimens may, however, be rather referrible to *S. fascicularis.* The whole group requires further study from the living plant or from specimens gathered in all the different stages of development of the flowers.

41. **S. sparteus,** *R. Br. Prod.* 231.—Stems very slender but rigid, 1 to 2 ft. long, leafless except the brown sheaths at the base bearded at the orifice, with a short recurved subulate point rarely lengthened into a lamina of 2 or 3 in., and occasionally 1 or 2 similar sheaths with short subulate laminæ higher up the stem. Panicle narrow, loose, 1 to 2 in. long, besides a flowering bract occasionally at some distance lower down. Bracts like the lower sheaths but gradually shorter. Spikelets few within each sheath, all pedicellate or 2 or 3 on a short branch in the lower sheaths, all narrow, very acute, not much flattened, dark brown, about 4 lines long, with about 3 flowers. Glumes acuminate or almost obtuse, fringed with woolly hairs or at length glabrous, 5 or 6 outer empty ones gradually shorter. No hypogynous bristles. Stamens 3. Nut ovoid or obovoid, obtusely 3-angled, obscurely striate or smooth.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown.*

Queensland. Wednesday Island, Torres' Straits, *Moseley,* also *Armitage* without indication of the special station.

42. **S. vaginatus,** *F. Muell. Herb.*—Stems 1 to 2 ft. long (or more ?) leafless except a few distant brown sheaths about ½ in. long, bearded at the orifice and bearing usually an erect rigid narrow lamina of ¼ to ½ in., or rarely the lower ones with a narrow-linear leaf of 2 to 3 in., the stem readily disarticulating within each sheath. Panicle narrow, the short erect branches clustered, the lowest sometimes above 1 in. long. Lower sheathing bracts like the sheaths on the stem, the upper ones

with very short points. Spikelets not numerous, all pedicellate but erect, dark brown, very narrow, slightly compressed, 4 to nearly 5 lines long, with about 3 flowers. Glumes acutely acuminate, glabrous or fringed with a few hairs, about 3 outer ones empty and gradually shorter. No hypogynous bristles. Stamens 3. Young nut obovoid, 3-angled.

Queensland. Brisbane River, Moreton Bay, *F. Mueller.*
N. S. Wales. New England, *C. Stuart* ; Beroa, Bunya district, *Leichhardt.*

43. **S. falcatus,** *R. Br. Prod.* 232.—Stems 2 to 3 ft. high, striate, often more or less flattened. Leaves at the base of the stem with short open sheaths produced into a concave erect lamina, often 2 lines broad at the base, but ending in a long subulate point, 1 or 2 of the leaves 1 ft. long or more, the stem-leaves few, with brown or black closed sheaths and shorter laminæ. Panicle long and very narrow, the branches clustered and erect, the lower ones often distant and elongated, the whole panicle above 1 ft., the sheathing bracts like the stem-leaves but gradually smaller. Spikelets numerous, all pedicellate, light brown, linear-lanceolate, falcate or rarely straight, flat, varying from 4 to 6 lines long with 3 to 6 or even more flowers. Glumes acute or the lower ones aristate, 2 or rarely 3 outer empty ones shorter. Hypogynous bristles none or very small, 1 rarely as long as the nut. Stamens 3. Nut obovoid, very obtuse, 3-ribbed, minutely striate or cancellate. —F. Muell. Fragm. ix. 29; *S. elatus,* Bœckel. in Flora, 1875, 117 (from the char. given).

W. Australia. Islands of the Gulf of Carpentaria, *R. Brown* ; Fitzmaurice and Wentworth Rivers, *F. Mueller.*
Queensland. Burdekin River, *Armitage* ; Bowen Downs, *Birch* (with remarkably large spikes) ; Mount Wheeler, *Thozet* (spikelets young with only 2 flowers as yet developed).

44. **S. punctatus,** *R. Br. Prod.* 232.—Stems 2 ft. high or more, leafy. Lower leaves very long, floral bracts gradually shorter, all subulate-filiform almost from the sheath. Panicle 6 in. to 1 ft. long, leafy, slender and loose. Spikelets very numerous, all pedicellate, lanceolate, slightly falcate, more or less flattened, scarcely 2 lines long, rather pale brown, with 2 flowers. Glumes thinly membranous, rather obtuse, 2 outer empty ones shorter. No hypogynous bristles. Stamens 3. Nut ovoid-oblong, obtusely 3-angled, marked with impressed dots (*R. Brown*), not ripe in the spikelets examined.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown.*

SERIES IX. LAXÆ.—Spikelets under ½ in. long, few, on slender pedicels. Hypogynous bristles usually present. Leaves at the base of the stem very narrow or subulate.

45. **S. indutus,** *F. Muell. Herb.*—Stems slender, attaining about 1 ft., at first clothed with long spreading hairs, but the older ones often glabrous. Leaves few at the base of the stem, almost subulate, 1 to 3

in. long, the outer one with a short open sheath, the inner sheath close and slightly membranous at the orifice. Panicle very loose, with few spikelets, all on long pedicels, solitary or clustered in the axils of short slender dark brown sheathing bracts. Spikelets dark brown, lanceolate, flattened, about 3 lines long, with 2 or 3 flowers. Glumes very acute or the inner ones obtuse, 4 to 6 outer empty ones gradually shorter with the points sometimes slightly spreading. Hypogynous bristles 6 or fewer, very irregular, 1 or 2 longer than the young nut, the others often very small. Stamens 3. Nut not seen ripe.

W. Australia, *Drummond, n.* 207, 382.

46. **S. bifidus,** *Bœckel. in Linnæa,* xxxviii. 282.—Stems slender, 6 to 9 in. high. Leaves rather numerous at the base of the stem and much shorter, subulate, flexuose, dilated at the base into narrow open sheaths. Panicle loose with few spikelets, the pedicels long and solitary or two together within distant leafy bracts, with black closed sheaths and subulate laminæ. Spikelets erect, black, lanceolate, much flattened, 4 to 5 lines long, with 2 or 3 flowers. Glumes obtuse, 4 or 5 outer empty ones gradually shorter. Hypogynous bristles 6 or fewer, very unequal, 2 or 3 longer than the nut, often dilated and paleaceous, entire or toothed, the others very small. Stamens 3. Nut obovoid-oblong, 1 line long, 3-ribbed, granular-tuberculate.—*Elynanthus bifidus,* Nees in Ann. Nat. Hist. ser. 1, vi. 48; *Chætospora oligostachya,* F. Muell. Fragm. ix. 38.

W. Australia, *Drummond, 1st coll. also n.* 342 *and* 900; King George's Sound, *Muir.*

The end of the rhachis of the spikelet and terminal glume are often enlarged and densely villous as in *S. brevisetis.*

SERIES X. MICROCARPÆ.—Spikelets small, in a terminal loose cluster or irregular umbel or clustered in the axils of distant leafy bracts. Nuts, except in *S. fluitans,* very small and white. Small or slender and weak plants with flaccid leaves, the sheaths not bearded.

47. **S. Brownii,** *Hook. f. Handb. N. Zeal. Fl.* 298.—Stems tufted, slender, often filiform, from 2 or 3 in. to near 1 ft. high. Leaves narrow-linear or filiform, a few at the base of the stem with short points or laminæ, 1 to 3 higher up with closed sheaths and longer laminæ. Spikelets few together in clusters or little umbels, the clusters sessile or pedunculate, several from each sheath, the lower ones distant, the whole forming a narrow panicle or small irregular umbel, or reduced to 2 or 3 rather dense clusters. Bracts with brown sheaths and leafy points. Spikelets linear or linear-lanceolate, brown or black, 2 to near 3 lines long, usually with 2 flowers. Glumes acute or the inner ones obtuse, 3 or 4 outer ones empty of which the 2 outermost very much shorter, the keel often minutely ciliate. Hypogynous bristles 6, very slender, from a little to very much longer than the nut. Stamens 3. Nut small, white, 3-ribbed, minutely verticulate under a

lens.—*Chætospora imberbis*, R. Br. Prod. 233; Bœckel. in Linnæa, xxxviii. 299; Sieb. Agrostoth. n. 27, Hook. f. Fl. Tasm. ii. 82, F. Muell. Fragm. ix. 35; *Isolepis margaritifera*, Nees in Herb. Berol.; *Scirpus margaritiferus*, Bœckel. in Linnæa, xxxvi. 697; *Chætospora tenuissima*, Steud. Syn. Glum. ii. 162, from the char. given, not of Hook. f.

Queensland. East Coast, *R. Brown*; Brisbane River, *F. Mueller*, *Bailey*.

N. S. Wales. Port Jackson to the Blue Mountains. *R. Brown*, and others.

Victoria. Very common from Port Phillip and Melbourne to Gipps' Land, *Robertson*, *F. Mueller* and others.

Tasmania. Very abundant throughout the island, *J. D. Hooker* and others; often much elongated with rather broader leaves when growing under water.

S. Australia. St. Vincent's Gulf to Murray River, *F. Mueller* and others.

The species is also in New Zealand.

48. **S. odontocarpus,** *F. Muell. Fragm.* ix. 32.—A small slender tufted plant, perhaps annual, closely allied to *S. Brownii.* Stems filiform, 1 to 4 in. high. Leaves at the base of the stem, much shorter, filiform, with narrow brown sheaths. Spikelets few together, in clusters or little umbels, the clusters generally 2 or 3 together, 1 sessile the others pedicellate at the summit of the stem or in the axil of a subulate leafy bract lower down. Spikelets narrow, dark brown, 1½ to 2 lines long, with 2 or 3 flowers. Flowering glumes obtuse, not ciliate, 1 or 2 outer empty ones shorter and more acute. No hypogynous bristles. Stamens 3. Nut small, prominently 3-ribbed, the ribs often forming as many prominent angles or small teeth, deeply foveolate-reticulate between the ribs.

W. Australia, *Burges*; Champion Bay and Murchison River, *Oldfield*; Stirling Range, *F. Mueller*.

49. **S. humilis,** *Benth.*—A dwarf densely tufted plant, rarely above 4 in. high and sometimes not 1 in. Leaves at the base of the stem few, narrow, flaccid, with broad brown sheaths. Floral leaves or bracts several along the stem with short sheaths and linear laminæ, varying from very short to longer than the inflorescence. Spikelets usually 2 to 4 together in short spikes in the axils of the lower bracts, solitary or 2 together in the upper ones, linear-lanceolate, green or brown, 2 to 3 lines long, with 4 or 5 flowers. Glumes membranous, sometimes thin and almost hyaline, sometimes brown, the outer ones gradually shorter but all enclosing flowers except the terminal one. Hypogynous bristles 6, usually rather longer than the nut and plumose. Stamens 3. Nut ovoid, prominently 3-angled, reticulate-cancellate between the angles and crowned by the conical continuous base of the style.

W. Australia. *Drummond, n.* 363; Kalgan, Tone and Vasse Rivers, *Oldfield*; north of Stirling Range, *F. Mueller*. Included by F. Mueller Fragm. ix. 38 in *Chætospora nana* (*S. nanus*), but appears to me to be much nearer to *S. sculptus*, differing chiefly in the hypogynous bristles.

50. **S. sculptus,** *Bœckel. in Linnæa*, xxxviii. 286.—Tufted and perhaps annual, the stems slender, from a few inches to nearly 1 ft. long.

Leaves at the base of the stem few and very narrow, with brown sheaths. Floral leaves or bracts several along the stem with short sheaths and linear laminæ, varying from very short to 1 or 2 in. Spikelets several together in little clusters or short spikes in the axils of the floral leaves, or the upper ones sometimes solitary, linear, 3 to 3½ lines long, with 3 to 6 flowers. Glumes membranous, brown or almost hyaline, narrow, the outer ones gradually shorter, but all enclosing flowers except the terminal one. Hypogynous bristles none or rarely 2 or 3 very slender and not plumose. Stamens 3. Nut ovoid, prominently 3-ribbed, deeply pitted or cancellate or at length quite smooth.—F. Muell. Fragm. ix. 30; *Elynanthus sculptus*, Nees in Pl. Preiss. ii. 79.

W. Australia. Swan River, *Drummond*, *1st coll. n.* 915 *or* 916, *Preiss*, *n.* 1863, 1745. The latter has more the habit but not the plumose bristles of *S. humilis*.

51. **S. axillaris,** *Hook. f. Handb. N. Zeal. Fl.* 298.—Stems very slender and weak, leafy, diffuse or creeping, 2 to 6 in. long, often very intricate. Leaves or leafy bracts flat and flaccid but very narrow or almost filiform, ½ to 1½ in. long. Spikelets usually 2 or 3 together, sessile or shortly pedicellate in the axils of the leaves or leafy bracts, about 1 line long, somewhat flattened, with 1 perfect flower. Glumes obtuse, glabrous, brown with green keels, 2 or rarely 3 outer empty ones shorter. Hypogynous bristles 6 or sometimes fewer, about as long as the nut. Stamens 3. Nut small, obovoid, white or ash-coloured, 3-ribbed, smooth or minutely reticulate.—*Chætospora axillaris*, R. Br. Prod. 233; Hook. f. Fl. Tasm. ii. 82; Fl. Nov. Zel. t. 62; Bœckel. in Linnæa, xxxviii. 289; F. Muell. Fragm. ix. 34; *Helothrix pusilla*, Nees in Ann. Nat. Hist. ser. 1, vi. 45.

N. S. Wales. Nepean River. *R. Brown.*
Victoria. Marshes, Snowy River, *F. Mueller;* Grampians, *Sullivan.*
Tasmania. Marshy places near Penquite, *Gunn;* Southport, *C. Stuart.*
S. Australia. Cataracts of Lofty Range, *F. Mueller.*
W. Australia, *Drummond.*

The species is also in New Zealand.

52. **S. tenellus,** *Benth.*—A dwarf tufted plant, the filiform stems 1 to 2 in. high in our specimens. Leaves nearly as long, capillary, flaccid, with membranous glabrous sheaths. Spikelets 1 terminal and 1 or 2 at some distance lower down, in short narrow sheathing bracts, all very narrow-linear, about 2 lines long, with 2 or 3 flowers. Glumes very narrow, membranous, pale-coloured, rather acute, 1 or 2 outer empty ones shorter and more acuminate. No hypogynous bristles. Stamen 1. Style very slender. Nut obovoid-oblong, but not ripe in our specimens.

W. Australia. *Drummond, n.* 927. Evidently allied to *S. fluitans*, but different in habit, and the stamen appears to be always solitary.

53. **S. natans,** *Benth.*—Stems submerged, capillary, branched and

leafy, forming floating masses often above 1 ft. long, the leaves as well as the branches more slender than in *S. fluitans.* Spikelets solitary and terminal or with another lower down the branch or peduncle, light brown, very narrow linear, 2 lines long, with 2 flowers. Glumes narrow, almost obtuse, one outer empty one rather shorter. Hypogynous bristles 6 or fewer, rather longer than the nut, ciliate almost plumose. Stamens 3. Nut small, ovoid, prominently 3-ribbed, smooth but sometimes tipped with a minute pubescent point.—*Chætospora natans*, F. Muell. Fragm. ix. 38.

W. Australia, *Drummond.*

54. **S. fluitans,** *Hook. f. Fl. Tasm.* ii. 81. *t.* 141 *B.*—Stems usually submerged, slender and weak, branched, leafy, forming short dense tufts in shallow stagnant water, or intricate floating masses 1 to 2 ft. long in running water. Leaves filiform, 1 to 3 in. long, the sheaths sometimes with a small membrane at the orifice. Spikelets solitary or rarely 2 or 3 distant ones at the end of the branches, the upper bract almost glumelike, the lower more leaflike, the spikelet very narrow linear, 4 to 5 lines long, with 2 to 4 flowers. Glumes narrow, rather obtuse, only one or sometimes no empty one besides the subtending bract. No hypogynous bristles. Stamens 3. Style sometimes long-persistent but always falling off from the ripe nut as in the rest of the genus. Nut ovoid, nearly 1 line long, prominently 3-ribbed, smooth but often tipped by a minute pubescent point.—F. Muell. Fragm. ix. 28.

Tasmania. South Esk River, *Gunn.*

19. ELYNANTHUS, Nees.

Spikelets clustered in a narrow panicle, with usually 2 hermaphrodite flowers close together on a short not flexuose rhachis, both fertile or one sterile. Glumes distichous, 2 to 4 outer ones empty and a small empty one close above the flowers. No hypogynous bristles. Stamens 3 to 8. Style slender, with a thickened hard persistent base continuous with the ovary; stigmatic branches 3 or 4, filiform. Nut ovoid, crowned by the hard ovoid or oblong persistent base of the style, sometimes as big as itself and either continuous with it or slightly contracted under it. Perennials with the habit of the narrow paniculate *Schœni.*

Besides the two Australian species which are endemic, the genus includes several from South Africa, the characters of some of which however require revision. The spikelets are nearly those of *Schœnus*, but without the elongated flexuose rhachis, and the style and nut are almost as in *Caustis.*

Spikelets about 6 lines long, densely clustered or almost spicate in the axils of leafy bracts. Stamens 6 to 8 . . 1. *E. octandrus.*
Spikelets 1½ to 2 lines long, few together in the axils of the sheathing bracts. Stamens 3. . . . . 2. *E. capillaceus.*

E. revolutus, Nees in Pl. Preiss. ii. 78, from Swan River, *Preiss*, n. 1769, is unknown to me but probably not a congener. It is described as having linear-filiform leaves with *revolute* margins. Spikelets in a terminal irregularly decompound cluster, with 2 or 3 involucral bracts 3 to 6 in. long. Glumes 7, 3 or 4 outer empty ones oblong-lanceolate acuminate, uppermost 1 or 2 also empty but small and narrow, the intermediate ones floriferous. Stamens 8 or 9. Style bulbous at the base, 3-cleft.

1. **E. octandrus,** *Nees in Ann. Nat. Hist. ser.* 1, vi. 48, *and in Pl. Preiss.* ii. 77.—Stems from a thick bulblike base 1 to 2 ft. high, angular, leafy. Leaves flat but narrow, rigid, tapering into long subulate points, the radical ones with short open sheaths, those on the stem few, distant, with long close sheaths, passing into the floral bracts. Spikelets in dense clusters or oblong heads of ½ in. or more, several together shortly pedunculate or sessile in the lower bracts, the upper ones forming an interrupted spike, the floral leaves or bracts like the stem-leaves but with gradually shortened subulate laminæ or points. Spikelets very narrow, about 6 lines long. Glumes dark brown or black with light-coloured margins, lanceolate, very acutely acuminate, 2 or 3 outer empty ones shorter and broader. Flowers both hermaphrodite but only one fertile. Stamens 6 to 8. Style-branches (always ?) 4. Nut ovoid, 4-ribbed, smooth, crowned as in *Cladium mariscus* by the thick base of the style, continuous with it but solid and nearly as long as the endocarp below it.—*Schœnus octandrus*, F. Muell. Fragm. ix. 31.

W. Australia. King George's Sound to Swan River, *F. Mueller*, *Muir*, *Drummond*, 1*st coll.*, *Preiss*, *n.* 1770, 1771, *Oldfield* and others.

2. **E. capillaceus,** *Benth.*—Stems filiform, ¾ to 1½ ft. long, leafless except a rather long sheath at the base, either truncate or with a setaceous lamina or point. Panicle small and narrow, the spikelets 3 or 4 together in the axil of the lower sheathing bract, 1 or 2 in the upper ones, the bracts with short subulate points. Spikelets very narrow, 1¼ to 2 lines long. Glumes acute or acuminate, 3 or 4 outer empty ones rather shorter. Flowers usually only one fertile. Stamens 3. Nut ovoid, crowned by the ovoid persistent base of the style as long as itself as in *Caustis*.—*Chætospora capillacea,* Hook. f. Fl. Tasm. ii. 81, t. 141 A ; *C. capillaris*, F. Muell. Fragm. ix. 34.

Victoria. Curdie's Inlet, *Walter ;* base of Mount Abrupt, *Sullivan.*

Tasmania. Hospital Bay, South Huon River, *Oldfield ;* Southport, *C. Stuart ;* Bay of Fires, *Bissil.*

W. Australia? Point Henry, *Oldfield.* Possibly some error in the label.

On examining more than a dozen spikelets from different specimens I have been unable to detect any trace of the 3 hypogynous scales figured in the plate, which must be very exceptional or perhaps some mistake of the artist.

20. MESOMELÆNA, Nees.

(Gymnoschœnus, *Nees.*)

Spikelets numerous in a dense head enclosed within the sheaths of the involucral bracts, with 2 flowers, the upper one fertile, the lower sterile or male, (or 1 only, the lower one deficient in *M. deusta*), the rhachis short. Glumes distichous or nearly so, 2 to 4 outer ones empty, the flowering ones closely enveloping the flowers. Hypogynous bristles or scales 3, often flat. Stamens 3. Style thickened and rigid in the lower part but at length usually deciduous ; stigmatic branches 3. Nut obovoid, crowned when young by the hardened base of the style, inserted on a raised torus or a short thick stipes.—Densely tufted rigid perennials. Leaves at the base of the stem only, often long, or rarely 1 on the stem. Flower-head solitary and terminal, the enclosing bracts broad and rigid often black, one usually and sometimes 2 or more with linear points or laminæ.

The genus is limited to Australia. It is well characterised by the inflorescence as well as by the hypogynous bristles or scales constantly 3 only and all equal.

Flower-heads ovoid or oblong, or turbinate-globose, black. Hypogynous bristles or scales rigid, longer than the nut.
  Heads under ½ in. Outer glumes aristate with recurved points . . . . 1. *M. stygia.*
  Heads above ½ in. Leafy points of the bracts erect. Spikelets 6 to 8 lines long . . . . 2. *M. deusta.*
  Heads above ½ in. Bracts very broad with long rigid spreading leafy points. Spikelets 4 to 5 lines long 3. *M. tetragona.*
Flower-heads globular, very compound. Spikelets 2 to 3 lines long. Hypogynous bristles short and slender.
  Outer bracts orbicular or very broad, with short or without any points. Eastern species . . . . 4. *M. sphærocephala.*
  Outer bracts ovate, one or more with long leafy points. Western species . . . . 5. *M. anceps.*

1. **M. stygia,** *Nees in Pl. Preiss.* ii. 89.—Stems slender, terete, rigid, 6 in. to 1 ft. high. Leaves at the base only, the sheaths rigid, 1 to 1½ in. long, the lamina nearly as long, subulate, bordered at the base by a hyaline membrane. Flower-head ovoid or turbinate-globose, erect or oblique, quite black, 3 to 6 lines diameter. Two outer bracts black with scarious hyaline margins, the outermost one usually with a rigid erect green-pointed lamina of 1 in. or more and apparently continuing the stem, the second bract without any or only a very short point. Spikelets numerous, sessile, 3 to 4 lines long. Flowers 2, both hermaphrodite and close together, the outermost usually sterile. Glumes scarcely distichous, about 5 empty, the outer ones short but aristate, the fine black points recurved when dry, the inner ones acuminate with short points, the flowering ones broader and more membranous. Hypogynous bristles or rather scales 3, flat, paleaceous, very acute and brown at the end, sometimes much dilated at the base and sometimes with a tooth on each side of the central point. Stamens 3. Style hard and thicker at the base but deciduous. Nut obovoid, very obtuse, smooth, seated on a raised torus or short thick stipes slightly dilated and lobed under the nut.—*Chætospora stygia*, R. Br. Prod. 238 ;

F. Muell. Fragm. ix. 36 ; *Mesomelæna Preissii*, Nees, in Pl. Preiss. ii. 88 ; *Lepidosperma uncinatum*, Nees, l. c. ii. 93.

W. Australia. King George's Sound, *R. Brown* and others, and thence to Swan River, *Drummond* 1*st. coll. and n.* 251, 894, *Preiss*, *n.* 1760, 1761, 1777, 1786, 1791 ; Murchison River, *Oldfield.*

The northern specimens are generally taller and stouter than those from King George's Sound, the spikelets often 4 lines long, the glumes sometimes with broad hyaline margins. The laminæ of the outer bracts very variable.

2. **M. deusta**, *Benth.*—Stems densely tufted on a horizontal rhizome, rigid, 6 in. to 1 ft. high. Leaves much shorter, all radical with open sheaths or one embracing the stem with a longer close sheath. Flower-head ovoid or turbinate, $\frac{1}{2}$ to $\frac{3}{4}$ in. long; outer bracts 2, erect, the sheaths as long as the spikelets, black and rigid with scarious hyaline margins, and erect leafy points, $\frac{1}{2}$ to 1 in. long on the outer bract shorter on the second, the bracts within the head more glume-like. Spikelets numerous, sessile, 6 to 8 lines long, very narrow, 1-flowered, dark-coloured. Glumes not strictly distichous, 4 or 5 empty ones nearly of the same length, the pubescent keels ending in short points, rather longer and more obtuse on the outer ones, the inner ones with membranous sides, the flowering glume thin and hyaline, and above the flower an empty glume more like the outer ones but smaller. Hypogynous bristles 3, nearly as long as the glumes, ciliate in the lower part. Stamens 3. Style long, rigid at the base. Nut not seen ripe but the enlarged ovary oblong, tapering into the continuous style.—*Carpha deusta*, R. Br. Prod. 230 ; Bœckel. in Linnæa, xxxviii. 269; *Chætospora deusta*, F. Muell. Fragm. ix. 39 ; *Rhynchospora deusta*, Spreng. Syst. i. 195 ; *Desvauxia aristata*, Nees in Sieb. Agrostoth. n. 25.

Queensland. Brisbane River, *Bailey.*

N. S. Wales. Port Jackson, *R. Brown*, *A. Cunningham* and many others ; New England, *C. Stuart*, *C. Moore ;* Beronda Station, *Leichhardt.*

3. **M. tetragona**, *F. Muell. Fragm.* ix. 36.—Stems from a thick rhizome rigid, angular or flattened, $1\frac{1}{2}$ to 2 ft. high. Leaves radical, rather long, erect, rigid, not above 1 line broad, the sheathing base brown and membranous on the margin, and often one leaf on the stem with a long closed sheath and shorter erect lamina. Flower-head turbinate-globose, usually nodding, $\frac{3}{4}$ to 1 in. broad. Involucral bracts 3 or 4, very broad, coriaceous, black, closely embracing the spikelets, and as long as them, the outer 2 or 3 produced into long rigid leafy laminæ, the lowest sometimes 8 to 10 in. long, and several of the bracts within the head often protruding short linear points or laminæ. Spikelets numerous, 4 to 5 lines long, narrow-lanceolate, slightly flattened, with 2 flowers close together, the lowest male, the upper one hermaphrodite. Glumes obscurely distichous, 1 or 2 outer empty ones tapering to rigid dark-coloured points, the sides broadly membranous closely enveloping each other, the outer flowering one brown in the centre with broad almost hyaline margins closely wrapped round the flowers, the inner glume round the fertile flower exceedingly thin.

Hypogynous bristles 3. Stamens 3 with long anthers. Style hardened at the base but at length deciduous. Nut ovoid, obtuse, smooth and shining, nearly 2 lines long.—*Chætospora tetragona*, R. Br. Prod. 233; Nees in Pl. Preiss. ii. 86; F. Muell. Fragm. ix. 36.

W. Australia. King George's Sound, *R. Brown*, *A. Cunningham* and others, and in many stations thence to Vasse and Swan Rivers, *Drummond*, *Preiss*, *n.* 1807, *Oldfield* and others.

4. **M. sphærocephala**, *Benth.*—Stems in large tufts 3 to 5 ft. high, slender but rigid, usually compressed or 3-angled under the inflorescence. Leaves at the base of the stem long, rigid, flat or concave, rarely above 1 line broad, but dilated at the base into open brown sheaths fringed with long woolly hairs. Flower-head very compound and dense, globular, about ½ in. diameter. Involucral bracts very broadly ovate or orbicular, as long as or rather longer than the spikelets; one outer one tapering to an obtuse point usually very short but sometimes longer and leaflike, all the others very broad and obtuse, and several similar bracts prominent within the head. Spikelets very numerous, somewhat compressed, 2 to 3 lines long. Flowers 2 close together, the outer one male the upper hermaphrodite. Glumes obscurely distichous, 4 or 5 outer ones very broad and obtuse gradually shorter, flowering glumes nearly twice as long, broad and completely enveloping each other, the outer one rigid, the inner more membranous. Hypogynous bristles 3, short and slender. Stamens 3. Style-branches 3. Nut obovoid, seated on a raised torus or thick stipes, crowned by the narrow pubescent base of the style (perhaps at length deciduous).—*Chætospora sphærocephala*, R. Br. Prod. 233; Bœckel. in Linnæa, xxxviii. 296; F. Muell. Fragm. ix. 33; *Gymnoschœnus sphærocephalus*, Hook. f. Fl. Tasm. ii. 83, t. 142; *Xyris lævis*, Nees in Sieb. Pl. Nov. Holl. n. 204; *Gymnoschœnus adustus*, Nees in Ann. Nat. Hist. ser. 1. vi. 47.

N. S. Wales. Port Jackson, *R. Brown* and others; northward to New England, *C. Stuart*, *Leichhardt*; southward to Twofold Bay, *F. Mueller*.

Victoria. Bunip Creek, Gipps' Land, Wilson's Promontory, Mount Imlay, *F. Mueller*; Mount William Creek, *Sullivan*.

Tasmania. Abundant in marshes in many parts of the island, *Gunn* and others.

5. **M. anceps**, *Benth.*—Very closely allied to *M. sphærocephala*. Stems more slender than in that species though rigid, 1 to 2 ft. high or perhaps sometimes more, often compressed under the inflorescence. Leaves as long as or longer than the stem, crowded at its base, nearly 1 line broad, obtuse, rigid, dilated at the base into long brown open sheaths fringed with long slender hairs. Flower-head globular, rather smaller than in *M. sphærocephala*, the involucral bracts ovate, 2 or more of them produced into linear points or laminæ sometimes very short but often 1 or even 2 in. long, the inner bracts small. Spikelets very similar to those of *M. sphærocephala*, with 2 or 3 short outer empty glumes, and 2 flowering ones much longer and completely enveloping each other. Flowers 2, apparently similar to those of *M. sphæro-*

cephala, but too young for accurate description in our specimens.—*Chætospora anceps.* R. Br. Prod. 233; *Chætospora elongata*, Nees in Pl. Preiss. ii. 275; *Schœnus elongatus*, F. Muell. Fragm. ix. 30.

W. Australia. King George's Sound and neighbouring districts, *R. Brown*, *Drummond*, *n.* 267, *Preiss*, *n.* 1560, *F. Mueller* and others. A more perfect series of specimens may prove this to be a variety only of *M. sphærocephala.*

21. CARPHA, R. Br. partly.

Spikelets in a loose terminal cluster or corymb, or in a species not Australian, in a long panicle, with 1 flower. Glumes several, distichous, membranous, pale brown, the outer empty ones gradually shorter. Hypogynous bristles 6, long, plumose, spreading and pappus-like under the fruit. Stamens 3. Style branches 3. Nut oblong, 3-angled, tapering into the hardened persistent base of the style.—Perennials, leafy at the base only.

Besides the Australian species, which is also in New Zealand, there is one nearly allied to it in Antarctic and Chilian South America, and a third with a different habit but a congener in essential characters in New Caledonia. Brown included five Australian species in the genus, but with doubts as to some of them. Of these three in which the glumes are not distichous now form the genus *Cyathochæta*, and the fourth in habit as well as in the bristles and other characters appears to be better placed in *Mesomelæna.*

1. **C. alpina,** *R. Br. Prod.* 230.—Stems under 6 in. high in high alpine situations, attaining 1 ft. when luxuriant. Leaves at the base only and much shorter, rather rigid, obtuse, flat or concave, ½ to 1¼ lines broad, with broad membranous open sheathing bases. Corymb terminal, sometimes dense almost forming a head, sometimes the partial clusters loose and shortly pedunculate. Involucral bracts usually 2, leaflike and longer than the inflorescence, the inner ones smaller narrow and more glumelike. Spikelets flat, lanceolate, pale-coloured, varying from 4 lines in the smaller specimens to 6 or 7 lines long in luxuriant ones. Glumes usually 4, distichous, acute, very thinly membranous or almost hyaline but rather rigid and chaff-like, the outer ones much shorter, and above the flower a small narrow empty glume. Hypogynous bristles nearly as long as the glume, plumose the whole length with long hairs, persistent and spreading or recurved under the fallen nut. Nut nearly 2 lines long, terminating in a rigid point formed by the base of the style, which shows no sign of falling off in any of the specimens seen.—Kunth, Enum. ii. 322; Bœckel. in Linnæa, xxxviii. 269; Hook. f. Fl. Tasm. ii. 84; Hook. Ic. Pl. t. 1216; *Rhynchospora alpina*, Spreng. Syst. i. 195; *Carpha nivicola*, F. Muell. in Trans. Phil. Soc. Vict. i. 111, and in Hook. Kew Journ. viii. 335; *Chætospora alpina*, F. Muell. Fragm. ix. 39.

Victoria. Hardinger Range and Mount Wellington, *F. Mueller.*

Tasmania. Table Mountain (Mount Wellington) *R. Brown;* not uncommon on the mountains at an elevation of 4000 to 5000 ft., *J. D. Hooker.*

Also in New Zealand.

22. TRICOSTULARIA, Nees.

(Discopodium, *Steud.*)

Spikelets in a spikelike or loose or much-branched panicle, with 1 to 3 flowers, the upper one fertile, the lower sterile or male or deficient, the rhachis very short and straight. Glumes scarcely distichous, membranous, pale brown, 2 to 4 outer empty ones, and a small narrow empty one immediately above the upper flower. Hypogynous bristles 6 or fewer, short slender and usually unequal. Stamens 3. Style slender, deciduous; stigmatic branches 3, filiform. Nut obovoid, often contracted at the base but not distinctly stipitate.—Perennials. Leaves radical, often reduced to sheathing scales rarely 1 or 2 distant on the stem. Spikelets rather small, sessile or pedunculate, solitary or clustered in the axils of sheathing bracts of which the lower ones have sometimes leaflike laminæ, or variously paniculate.

Besides the Australian species which are endemic, there is one in Ceylon and another in Borneo. The nut is nearly that of *Schœnus*, but the flowers when more than one are close together without the more or less flexuose rhachis characteristic of *Schœnus*, and it is the terminal not the lower one which is specially fertile.

Panicle very loose, narrow, leafy. Leaves linear or subulate, chiefly radical. Spikelets 2 to 2½ lines, with 2 rarely 3 flowers . . . . 1. *T. paludosa.*
Spike of 2 or 3 2-flowered spikelets. Leaves shortly subulate or reduced to sheathing scales . . . . 2. *T. pauciflora.*
Panicle short and spikelike. Spikelets 2-flowered. No leaves besides the sheathing scales at the base of the stem.
  Spikelets ovoid-oblong, scarcely 2 lines. Outer bracts 2 to 4 lines long . . . . 3. *T. compressa.*
  Spikelets narrow, fully 2 lines. Outer bracts erect, 6 to 9 lines long . . . . 4. *T. Neesii.*
Panicle compound, rather dense, spreading. Spikelets numerous, clustered, 1-flowered, 1½ to 2 lines long. Leaves radical, linear . . . . 5. *T. fimbristyloides.*

1. **T. paludosa,** *Benth.*—Stems slender, rather weak, 6 in. to 1½ ft. high. Leaves at the base of the stem much shorter, narrow-linear or almost subulate, and 1 or 2 on the stem passing into the floral bracts. Panicle long narrow and very loose, the spikelets not numerous, all pedicellate, the peduncle or branches 2 or 3 together in the axils of leafy bracts, the lower bracts distant with long linear-subulate laminæ, the upper ones small. Spikelets 2 to 2½ lines long, usually erect, lanceolate, more or less flattened, pale brown. Flowers usually 2, rarely 3, the upper one or rarely 2 fertile, the rhachis not elongated nor flexuose between them. Glumes distichous, acute or the outer one short and aristate, about 4 outer ones empty and a small empty glume close to the upper flower. Hypogynous bristles 6, shorter than the nut, shortly serrulate-ciliate. Stamens 3. Style slender, deciduous. Nut ovoid, finely 3-ribbed, smooth or minutely granular.—*Chætospora paludosa*, R. Br. Prod. 233; F. Muell. Fragm. ix. 35.

Queensland. Moreton Bay, *F. Mueller.*
N. S. Wales. Port Jackson, *R. Brown, F. Mueller, Gulliver.*

2. **T. pauciflora,** *Benth.*—Stems filiform, 6 in. to 1 ft. high. Leaves 1 or 2 at the base of the stem much shorter and subulate or all reduced to sheathing scales with short subulate points, and sometimes a similar sheathing scale on the stem higher up. Spike terminal, reduced to 2 or 3 spikelets, each in the axil of a narrow membranous bract, the lowest with a short subulate point and sometimes rather distant. Spikelets ovoid, brown, about 2 lines long, with 2 flowers, the lowest barren. Glumes broad, acutely acuminate, 2 outer ones empty, the lowest rather shorter. Hypogynous bristles 6, very short, sometimes slightly dilated at the base, but neither thickened nor enlarged under the fruit. Nut ovoid, obtuse, prominently 3-ribbed to the top and sometimes slightly pubescent. — *Lepidosperma pauciflorum*, F. Muell. Fragm. ix. 23.

Victoria. Near Mount Abrupt, *F. Mueller;* near Mount William, *Sullivan.* The specimens were inadvertently referred by Hooker, Fl. Tasm. ii. 93, to *Lepidosperma filiforme*, the hypogynous setæ are precisely those of *Tricostularia compressa*, and do not enlarge into scales as in *Lepidosperma*, and the style and nut are entirely those of *Tricostularia.*

3. **T. compressa,** *Nees in Pl. Preiss.* ii. 83.—Stems from a slightly bulbous base, slender but rigid, terete or more or less compressed, 6 in. to 1½ ft. high, leafless except a close sheath at the base oblique at the orifice and tapering into a short erect point. Spike terminal, almost simple, pale brown, rarely above ½ in. long. Involucral bracts very shortly sheathing, narrow-lanceolate, several-nerved, acutely acuminate, 2 to 4 lines long, the lowest often not longer than the next. Spikelets solitary in the upper bracts, 2 or 3 together in the lowest, ovoid-oblong, pale brown, about 2 lines long. Glumes obscurely distichous, 3 or 4 outer empty ones broad, membranous, obtuse or scarcely acute, the lower ones rather shorter, the flowering glumes rather longer and an empty acute one close above the upper flower, the two flowers close together, the lower one sterile or male. Hypogynous bristles exceedingly short. Nut obovoid, the 3 ribs scarcely conspicuous, slightly tuberculate, on a thick torus but scarcely stipulate.—*Chætospora spicata*, Bœckel. in Linnæa, xxxviii. 297; F. Muell. Fragm. ix. 37.

W. Australia. *Drummond, n.* 328 (348 in herb. *Hook.*); Konkoberup Hills, *Preiss, n.* 1800; Stirling Range, *F. Mueller.*

4. **T. Neesii,** *Lehm. Pl. Preiss.* ii. 83.—Stems slender, 1 to 1½ ft. high, leafless except a rather long close sheath at the base oblique at the orifice and tapering into an erect point of 1 to 3 lines. Spike terminal, almost simple, sometimes oblong and under ½ in. long, sometimes elongated to 1 or even 2 in. Involucral bracts erect, acute, striate, the lowest ½ to ¾ in. long, the next shorter. Spikelets solitary or few together in the bracts, sessile or shortly pedicellate, brown, narrow, 2 lines long or rather more. Glumes thinly membranous, about 3 outer ones empty, scarcely shorter but with a more rigid keel produced into a short point, the inner and flowering ones broader obtuse and quite membranous. Flowers close together, both hermaphrodite,

but the lower one sterile. Hypogynous bristles very short. Nut obovoid, with 3 ribs very prominent on the top and sometimes slightly pubescent, contracted at the base, but not distinctly stipitate.—*Chætospora Neesii*, Bœckel. in Linnæa, xxxviii. 297; F. Muell. Fragm. ix. 37.

W. Australia, *Drummond, n.* 329, 356, 394, *Preiss, n.* 1728; Swan River, *Miss Lukin;* Blackwood River, *Oldfield, Mrs. Hard.*

Var. *elatior.* Stems stouter, 2 ft. high or more. Spike 1¼ to 2 in. long. Outer glume-like bracts striate, ¼ in. long.—*Drummond, n.* 322.

Discopodium Drummondii, Steud. Syn. Glum. ii. 150, includes this and the preceding species.

5. **T. fimbristyloides,** *Benth.*—Stems from a thick rhizome 1 to 2 ft. high, striate or angular. Leaves at the base only, shorter than the stem, 1 to 1½ lines broad, dilated at the base into a short open sheath bordered by a scarious membrane. Panicle compound, rather dense, 2 to 4 in. long, the branches clustered in the axils of leafy bracts with short brown sheaths and linear laminæ, the lowest sometimes as long as the inflorescence, the others much shorter, the secondary ones more glumelike. Spikelets in clusters of 2 to 6, narrow, brown, 1½ to 2 lines long, 1-flowered, the rhachis not elongated. Glumes membranous, acute, obscurely distichous, 2 outer empty ones, the lowest shorter and more acuminate, and close above the flower a narrow empty glume. Hypogynous bristles 6 or fewer, very fine, all very short or 1 or 2 as long as the nut. Stamens 3. Style slender, deciduous; branches 3. Nut ovoid, smooth, neither angled nor ribbed.—*Chætospora fimbristyloides*, F. Muell. Fragm. ix. 34.

N. Australia. Near Providence Hill, *F. Mueller;* Port Essington, *Armstrong.* This species is very nearly allied to the *Cladium undulatum*, Thw. Enum. Pl. Zeyl. 353 (*Lepidosperma zeylanicum*, Bœckel. in Linnæa, xxxviii. 332) from Ceylon, and to an unpublished Borneo species. These three might almost rank as a distinct genus. The inflorescence and nut bring them near *Cladium*, in which genus however there are never any traces of hypogynous bristles. The general inflorescence is also that of some species of *Rhynchospora* and *Scleria*, rather than of *Fimbristylis.* The hypogynous bristles are usually minute but rigid, they do not however grow into thick scales as in *Lepidosperma.*

23. LEPIDOSPERMA, Labill.

Spikelets paniculate, sessile, scarcely flattened, with 2 or more flowers, the uppermost alone fertile, or rarely only 1 flower, the rhachis very short. Glumes almost distichous, several or only 1 or 2 outer empty ones gradually shorter, and a narrow empty one close above the flower enclosed in the flowering glume. Hypogynous scales or bristles 6 or fewer by abortion, usually seta-like or very thin and hyaline or minute at the time of flowering, enlarged under the fruit, thickened white and almost spongy, acuminate or setiferous, closely appressed in two rows to the base of the fruit and sometimes slightly cohering to each other at the base. Stamens 3, or very rarely in abnormal flowers 4 or 5. Style slender and deciduous, with 3 or very rarely 4 filiform stigmatic branches. Ovary crowned by a thick hemispherical or cushion-like hardened apex (or base of the style?). Nut ovoid or oblong, obtusely 3-angled except the continuous obtuse apex.—Rhizome perennial. Stems flat, angular or terete. Leaves few at the base of the stem, equitant and vertically flattened or angular or terete like the stem, usually of the same breadth, and only to be distinguished from it by their sheathing base and their tapering to a fine point. Spikelets usually numerous, clustered or singly sessile along the branches of a terminal panicle, which is either large and diffuse or long and erect, or short and dense or spikelike. Outer bract subtending the panicle usually with an erect point or lamina, which varies very much in length in the same species but rarely exceeds the inflorescence, the bracts under the primary branches with short points to the sheathing base, the inner ones more or less glumelike.

Besides the Australian species, which are perhaps all endemic, there are two in New Zealand of which one however may be identical with an Australian one, and one in South China, closely resembling one of the South-western Australian ones.

The genus is one of the most natural among Cyperaceæ, although when in flower it is chiefly distinguished by the foliage and inflorescence; the principal technical characters, the peculiar hypogynous scales, can often be ascertained only under the ripe or far advanced nut. At the time of flowering the bristles are often those of *Schœnus* or of *Tricostularia;* as the ovary grows the peculiar apex is constant, so also are the full grown scales. In all these respects as well as in the position of the leaves, the inflorescence, the position of the flowers, the terminal one hermaphrodite and fertile, the others when present male or barren, the structure of the flowers and of the fruit there is no variation in the genus, and the species can only be distinguished by vague characters derived from the shape of the stem and leaves, the degree of development of the inflorescence, the number and shape of glumes, etc. The limits of the species are therefore often very vague, and several of those here admitted may on the comparison of living specimens prove untenable.

SERIES I. **Floribundæ.**—*Stems usually broad, but thick in the middle with acute margins, or acutely 4-angled. Panicle large, very compound, pyramidal or loose.*

Stems usually 3 to 6 lines broad, with broad acute edges and a raised centre.	
Panicle dense, the partial spikes clustered and sessile. Spikelets 3 lines long. Glumes mostly obtuse .	1. *L. gladiatum.*
Panicle loose, usually secund, the partial spikes at least in the lower clusters pedunculate. Spikelets 3 lines. Glumes acute or mucronate	2. *L. effusum.*
Panicle broad, with slender spreading branches. Spikelets 2 lines long	3. *L. rupestre.*
Stems 2 to 3 lines broad, with narrow acute edges and convex sides. Panicle loose, usually secund. Spikelets and nuts small	4. *L. elatius.*
Stems flat but thick, very acutely 4-angled. Panicle large and erect	5. *L. tetraquetrum.*

SERIES II. **Longitudinales.**—*Stems flattened but very convex on both sides. Panicle narrow and dense, spikelike or with erect spikelike branches.*

Spikelets small, slightly spreading. Glumes acuminate, with recurved points	6. *L. Oldfieldii.*
Spikelets very erect, with erect glumes.	
Stems usually above 3 lines broad. Panicle 6 in. long or more	7. *L. exaltatum.*
Stems usually under 3 lines broad. Panicle under 6 in. long, often spikelike and very dense	8. *L. longitudinale.*

SERIES III. **Densifloræ.**—*Stems flat or very slightly convex on one or both sides with acute edges,* 1, 2 *or rarely* 3 *lines broad. Panicle compound, short and dense, broad pyramidal ovate or rarely oblong, the branches or partial spikes sessile or nearly so in the clusters.*

Glumes acutely acuminate. Eastern species . . . . 9. *L. concavum.*
Outer glumes obtuse or scarcely mucronate. Western species . . . . 10. *L. angustatum.*

(The inflorescence of *L. concavum* sometimes approaches that of the *Floribundæ,* and that of *L. rupestre,* nearly that of *L. angustatum,* but the stems very different.)

SERIES IV. **Stenostachyæ.**—*Stems either broad and very flat and thin, or when very narrow slightly convex on one or both sides or angular. Panicle narrow, loose or elongated.*

Stems bordered on the edges by a fine brown line often resinous or with resinous exudations. Leaf-sheaths often resinous.
Spikelets with 1 barren flower. Glumes acute or acuminate.
Stems 3 to 6 lines broad, very flat, the margins continuous . . . . 11. *L. Drummondii.*
Stems 1 to 1½ lines broad, the sides often slightly convex, the margins continuous . . . . . . 12. *L. Brunonianum.*
Stems 1½ to 3 lines broad, flat, the margins resinous-tuberculate . . . . 13. *L. tuberculatum.*
Spikelets with 1 barren flower. Outer glumes obtuse 14. *L. resinosum.*
Spikelets with 2 or 3 barren flowers. Glumes rather acute . . . . 15. *L. viscidum.*
Stems not resinous, 1 to 2 or rarely 2½ lines broad.
Stems about 1 line broad, convex on both sides but with acute edges. Western species . . . . 16. *L. costale.*
Stems very flat 1½ to 2½ lines broad with very acute edges. Eastern species . . . . 17. *L. laterale.*
Stems flat but rather thick, 1 to 2 lines broad, the edge scarcely acute. Eastern species.
Panicle spike-like or interrupted. Inner bracts aristate. Glumes acutely acuminate . . . . 18. *L. congestum.*
Panicle spike-like, interrupted. Spikelets in small distinct clusters. Glumes acuminate . . . . 19. *L. globosum.*
Panicle slender. Spikelets few.
Leaves the breadth of the stem, equitant . . . 20. *L. lineare.*
Leaves none, replaced by sheathing scales . . . 21. *L. aphyllum.*
Stems ½ to ¾ lines broad, flat or angular.
Panicle branched, narrow but rather dense, 1 to 1½ in. long. Western species . . . . 22. *L. gracile.*
Panicle almost reduced to a simple spike with distant spikelets. Eastern species . . . . 23. *L. semiteres.*

SERIES V. **Tereticaules.**—*Stems slender, terete or angular-striate or slightly and irregularly compressed.*

Panicle very dense, ovoid, under 1 in. long . . . . . . 24. *L. pubisquameum.*
Panicle rather dense, compound, 1 to 2½ in. long, with erect or spreading branches.
Spikelets 3 lines long or rather more. Stems smooth. Eastern species . . . . 25. *L. canescens.*
Spikelets about 2 lines long. Western species.
Stems strongly striate and usually scabrous . . . 26. *L. scabrum.*
Stems smooth, scarcely striate . . . . 27. *L tenue.*

Panicle with few rather slender branches, erect or slightly spreading, the common rhachis straight . . . . . 28. *L. leptostachyum.*

Panicle slightly branched, with few spikelets, the common rhachis very much curved and reflexed.

Leaves filiform, longer than the stem. Western species . . . . 29. *L. leptophyllum,*

Leaves shorter than the stem. Eastern species . . . 30. *L. tortuosum.*

Panicle or spike simple or slightly branched, the spikelets narrow and distant, the rhachis filiform.

Spike branched, rhachis flexuose . . . . 31. *L. flexuosum.*

Spike simple; rhachis straight or nearly so . . . . 32. *L. filiforme.*

Panicle spikelike interrupted, the spikelets in dense clusters or partial spikes sessile along the simple rhachis.

Spikelets about 3 lines long, numerous. Barren flowers 2 or 3. Western species . . . . 33. *L. striatum,*

Spikelets about 3 lines long, numerous. Barren flower 1. Eastern species . . . . 34. *L. Neesii.*

Spikelets few in the clusters, very narrow, 4 to 5 lines long. Eastern species . . . . 35. *L. carphoides.*

SERIES I. FLORIBUNDÆ.—Stems usually broad but thick in the middle with acute margins or acutely 4-angled. Panicle large, very compound, pyramidal or loose.

1. **L. gladiatum,** *Labill. Pl. Nov. Holl.* i. 15, *t.* 12.—Stems rigid, attaining several feet, much flattened, but convex on both sides along the centre, usually nearly ½ in. broad, but varying from 3 to 7 lines, the acute very flat edges smooth or minutely scabrous. Leaves equitant, as broad as or broader than the stem and often as long. Panicle dense and compound, 3 to 6 in. long, the branches or secondary spikes densely clustered and all sessile, or rarely the panicle longer with the lowest cluster of spikes distant. Involucral bracts with short broad flat sheaths, the lowest with a rigid erect lanceolate or linear lamina rarely above 1 in. long, the upper with shorter points, the inner bracts embracing the branches and spikelets glumelike. Spikelets sessile crowded or clustered along the branches, about 3 lines long, with usually 1 barren flower below the perfect one. Glumes broad, obtuse or scarcely mucronate, 4 or 5 outer empty ones gradually shorter. Hypogynous scales very small hyaline and fringed at the time of flowering, thickened and acuminate but not setiferous under the fruit.—R. Br. Prod. 234; Kunth, Enum. ii. 316, Bœckel. in Linnæa, xxxviii. 315; Nees in Pl. Preiss. ii. 89; Hook. f. Fl. Tasm. ii. 90; F. Muell. Fragm. ix. 24; *L. ensatum,* Nees in Ann. Nat. Hist. ser. 1, vi. 47.

Victoria. Maritime sands, Portland, *Robertson, C. Stuart* and others.

Tasmania. Common on sand hills near the north coast, *Gunn;* King's Island, *Gowan* and others.

S. Australia. Memory Cove, *R. Brown;* Port Lincoln, *S. F. Browne;* Holdfast Bay, *F. Mueller.*

W. Australia. King George's Sound, *R. Brown, Oldfield,* also *Drummond, n.* 274; Swan River, *Preiss, n.* 1771.

2. **L. effusum,** *Benth.*—Stems many feet high, 3 to 6 lines broad, with broad acute flat margins and a raised centre as in *L. gladiatum* and

leaves the same. Panicle larger and looser, very compound, 6 in. to above 1 ft. long, the branches or partial panicles clustered in the sheathing bracts, but more or less pedunculate and the glumes much more mucronate or acute.

W. Australia. *Drummond*, n. 273, 275; King George's Sound and adjoining coast, *Muir* and others; Blackwood River, *Oldfield* and others. Possibly a variety of *L. gladiatum* but the differences constant in all the specimens from the various collectors.

3. **L. rupestre,** *Benth.*—Stems 2 or 3 ft. high, 3 to 5 lines broad, with broad acute flat margins and a raised centre as in *L. gladiatum* and leaves the same. Panicle broad, very compound, 3 to 4 in. long and often as broad, the spreading or recurved branches much more slender than in *L. gladiatum*. Spikelets about 2 lines long, narrow, incurved, with 1 barren flower besides the perfect one. Glumes all obtuse or the innermost scarcely acute, 5 or 6 outer empty ones gradually shorter. Bristles or scales minute or scarcely conspicuous at the time of flowering, normal under the fruit. Nut not seen.

W. Australia. Rocks, Murchison River, the stems very sweet-scented, *Oldfield.*

4. **L. elatius,** *Labill. Pl. Nov. Holl.* i. 15, *t.* 11.—Stems 3 to 8 ft. high, 2 to 5 lines broad, much flattened, but both sides convex, the edges very acute and slightly scabrous. Leaves equitant, as broad and nearly as long as the stem. Panicle 8 in. to 1 ft. long, loose and secund or nodding, the branches long and compound, clustered in the sheathing bracts. Lower bracts distant with rather long sheaths and the lowest with a lamina of 1 to 2 in., the upper bracts gradually smaller. Spikelets numerous, sessile along the branches, loose or rather crowded but not clustered, about 2 lines long. Barren flowers 1 to 6 besides the perfect one. Glumes acute or shortly mucronate, 1 to 4 outer empty ones shorter and sometimes an empty one above the barren flowers next to the fertile-flowering glume. Scales thin and hyaline at the time of flowering, thickened, acuminate but not setiferous under the nut, which is rather small.—R. Br. Prod. 234; Kunth, Enum. ii. 316; Bœckel. in Linnæa, xxxviii. 316; Hook. f. Fl. Tasm. ii. 90; F. Muell. Fragm. ix. 25; *Chætospora concava*, Nees in Ann. Nat. Hist. ser. 1, vi. 47.

Victoria. On the Yarra, *Sullivan;* Dandenong and Disappointment Mountains, *F. Mueller;* Mount Macedon, *Walter.*

Tasmania. Derwent River, *R. Brown;* common in forests and in damp soil throughout the island. *J. D. Hooker.*

5. **L. tetraquetrum,** *Nees in Pl. Preiss.* ii. 90.—Stems stout, from 3 or 4 ft. to twice that height, flat but thick, with 4 acute angles. Leaves similarly thick and 4 angled, dilated at the base into a broad sheath. Panicle loose and very compound, pyramidal, 6 in. to 1 ft.

long, the branches erect or flexuose. Outer sheathing bracts without any or only very short laminæ. Spikelets sessile along the branches, sometimes slightly clustered, about 3 lines long, with 1 or 2 or rarely more barren flowers besides the perfect one. Glumes acute or obtuse and shortly mucronate, 3 or 4 outer empty ones gradually shorter. Scales under the nut short and acute, 1 or 2 sometimes setiferous.—F. Muell. Fragm. ix. 24.

W. Australia. *Drummond*, *n.* 346; Darling Range, *Preiss*, *n.* 1762; King George's Sound, *F. Mueller*; Karri Dale, *Walcot*; Blackwood and Canning Rivers, *Oldfield.*

SERIES 2. LONGITUDINALES.—Stems flattened but very convex on both sides and sometimes hollow. Panicle narrow and dense, spikelike or with erect spikelike branches.

6. **L. Oldfieldii,** *Hook. f. Fl. Tasm.* ii. 91, *t.* 146, A.—Stems 4 to 6 ft. high, 2 to 3 lines broad, flattened but with very convex sides, the acute edges very narrow. Leaves the same breadth. Panicle long and narrow but interrupted, often exceeding 1 ft., the spikelets densely crowded on the short branches of the upper spikelike part of the panicle, the lower branches longer and more distant but erect. Lowest bract with a lamina sometimes 2 or 3 in. long, the upper ones very short. Spikelets of a rich brown, densely clustered, nearly 3 lines long, with 1 or 2 barren flowers besides the perfect one. Glumes acute or mucronate, the inner ones almost aristate with spreading points, 2 or 3 outer empty ones shorter. Scales under the nut narrow but thick, often tapering into a seta. Nut small as in *L. elatius.*

Tasmania. New Norfolk, *Oldfield;* Southport, *C. Stuart.*

7. **L. exaltatum,** *R. Br. Prod.* 234.—Very near *L. longitudinale* in which it is included by F. Mueller, and perhaps correctly so. Stems several feet high, 3 to 4 lines broad, flattened but convex on both sides and often hollow, the edges prominent, acute, slightly scabrous. Leaves the same breadth. Panicle 6 in. to 1 ft. long, erect, compound, the branches and spikelets numerous and erect. Lowest bract with a lamina rarely exceeding 1 in. Spikelets crowded, 2½ to 3 lines long, with 1 rarely 2 barren flowers besides the perfect one. Glumes acute or acuminate, 2 or 3 outer empty ones rather shorter. Scales very small when in flower, thickened but not so much enlarged under the fruit as in most species and narrow, not setiferous.—Nees in Pl. Preiss. ii. 90.

Queensland. Brisbane River, *Bailey;* Pine River, *Eades.*
N. S. Wales. Port Jackson, *R. Brown*; Blue Mountains, *Woolls;* New England, *C. Stuart*, also in *Leichhardt's* collection.
Victoria. Glenelg River, *Robertson.*
W. Australia, *Drummond;* Swan River, *Preiss*, *n.* 1758, 1764.

8. **L. longitudinale,** *Labill. Pl. Nov. Holl.* i. 16, *t.* 13.—Stems 3

to 5 ft. high, 2 or rarely 3 lines broad, compressed but both sides convex and often hollow and the edges though acute scarcely prominent. Leaves equitant, rather flatter and broader and shorter than the stem. Panicle erect, compound but narrow, 3 to 6 in. long, with dense erect spikelike branches, the lower branches distant and pedunculate. Spikelets crowded or clustered, erect, 2 to 3 lines long, with 1 or 2 barren flowers besides the perfect one. Glumes obtuse, shortly mucronate or the inner ones almost acute, 3 or 4 outer ones empty and gradually shorter. Scales under the nut narrow, acuminate.—Hook. f. Fl. Tasm. ii. 91.

Victoria. Wilson's Promontory and Prince Albert River, Gipps' Land, *F. Mueller*; French Island, *Beveridge*; Queen's Cliff, *Green*; Portland, *F. Mueller.*

Tasmania. Common in sandy and wet places near the sea, *J. D. Hooker* and others.

W. Australia. Gordon, Tone, South Hutt, and Tweed Rivers, *Oldfield*; Busselton, *Pries.*

SERIES III. DENSIFLORÆ.—Stems flat or very slightly convex on one or both sides, with acute edges, 1, 2 or rarely 3 lines broad. Panicle compound, short and dense, broadly pyramidal, ovate or rarely oblong, the branches or partial spikes sessile or nearly so in the clusters.

9. **L. concavum,** *R. Br. Prod.* 234.—Stems 1 to 2 ft. high, quite flat or very slightly convex on one side, 1½ to 2½ lines broad, the edges very acute, slightly scabrous. Leaves equitant, shorter than the stem and about as broad. Panicle in the typical form erect, compound, dense, oblong or thyrsoid 1½ to 3 in. long. Outer involucral bract longer or shorter than the panicle. Spikelets densely crowded and clustered, about 3 lines long, with 1 or 2 barren flowers besides the perfect one. Glumes acute, the inner ones acutely acuminate, the outer with shorter points, about 4 outer empty ones gradually shorter. Scales or bristles at the time of flowering scarcely dilated at the base, normally thickened under the nut into lanceolate scales with a seta-like point often wearing away.—*L. squamata,* R. Br. Prod. 235; F. Muell. Fragm. ix. 26, but not of Labill.; *L. Sieberi,* Kunth, Enum. ii. 320, Bœckel. in Linnæa, xxxviii. 318; *L. gladiatum,* Nees in Sieb. Agrostoth, n. 10, not of Labill.; *L. laterale,* Hook. f. Fl. Tasm. ii. 91, t. 147, A. not of R. Br..

Queensland. Rocks, Moreton Island, *F. Mueller*; Rockhampton, *Thozet* (with narrower stems).

N. S. Wales. Botany Bay, *Banks and Solander*; Port Jackson, *R. Brown* and others.

Victoria. Near Melbourne and Queenscliffe, *F. Mueller*; French Island, *Beveridge*; Gabo Island, *Maplestone.*

Tasmania. Derwent River, *R. Brown*; Circular Head and Georgetown, *Gunn*; Southport, *C. Stuart.*

S. Australia. Lake Victoria, *F. Mueller.*

Var. *pyramidatum.* Panicle looser, often above 6 in. long but very compound, the spikelets 3 lines long or more and the glumes acuminate as in the typical form.

—Moreton Bay, *F. Mueller;* Paramatta, *Woolls;* Twofold Bay, *F. Mueller;* Yarra, *Sullivan*, Ballarat, *F. Mueller;* Swanport, *Story;* Onkaparinga, *F. Mueller.*

The Tasmanian rather smaller forms, have probably on account of the dense inflorescence been supposed by R. Brown as well as by F. Mueller to be the *L. squamatum* of Labillardière, whose specimens do not appear to have been seen by Brown or by any subsequent botanist, and the narrow leaves and obtuse glumes figured are quite at variance with our plant. They seem rather to represent the *L. angustatum*, which however is exclusively Western.

10. **L. angustatum,** *R. Br. Prod.* 235.—Stems 1 to 2 ft. high, 1 to 2½ rarely 3 lines broad, very flat or at length convex on both sides, the edges acute and slightly scabrous or smooth. Leaves equitant, about the same breadth but usually shorter. Panicle very compact and compound, usually black, ovoid or pyramidal, 1½ to 2½ in. long and sometimes as broad, the branches as well as the spikelets erect or more or less spreading, more slender than in *L. concavum.* Spikelets 2 to 3 lines long or rarely rather more, narrow, with 1 barren flower besides the perfect one. Inner glumes acute or acuminate but the 2 to 4 outer empty ones gradually shorter and obtuse or very shortly mucronate. Bristles minute under the flower, scales under the nut lanceolate and acuminate with short or without any terminal setæ.—*L. squamatum*, Nees in Pl. Preiss. ii. 91, and perhaps of Labill. Pl. Nov. Holl. i. 17, t. 16; Bœckel. in Linnæa, xxxviii. 325.

W. Australia. King George's Sound and adjoining districts, *R. Brown, F. Mueller* and others, and thence to Swan River, *Preiss, n.* 1785, 1804, *Oldfield* and others, also *Drummond, n.* 41, 161, 276, 382, 880.

Var. *ustulatum.* Panicle small, ovoid, very dense, with rather larger pale-coloured spikelets.—*L. ustulatum*, Steud. Syn. Glum. ii. 157.—*Drummond. n* 345.

Var. *curvispicula.* Spikelets mostly curved, very spreading as well as the branches of the panicle.—King George's Sound and neighbouring districts, *F. Mueller, Oldfield, Muir* and others; *Drummond, n.* 37, 38, 53, 277, 874, 884; Busselton, *Pries.*

The specimen I have seen of *L. fimbriatum*, Nees in Pl. Preiss. ii. 91, *Preiss, n.* 1793, in very young flower, appears to be this species, the description however refers rather to *L. viscidum.*

Series IV. Stenostachyæ.—Stems either broad and very flat and thin, or when very narrow slightly convex on one or both sides or angular. Panicle narrow, loose or elongated.

11. **L. Drummondii,** *Benth.*—Stems 2 to 3 ft. high, 3 to 6 lines broad, very flat or very slightly convex on one side, prominently striate, the edges acute, bordered by a brown line entire or slightly resinous-scabrous. Leaves equitant and as broad, the sheaths usually resinous. Panicle narrow and loosely compound, 4 to 8 in. long, the branches slightly spreading and usually secund, the lower ones long and sometimes the lower clusters distant. Lowest bract with a leaf-like lamina short or long. Spikelets in little spikes or clusters, scarcely

2 lines long, with 1 barren flower besides the perfect one. Glumes acute or mucronate, 2 or rarely 3 outer ones empty. Scales under the nut lanceolate, acute, with short points.

W. Australia, *Drummond n.* 111; King George's Sound, *Maxwell, Oldfield.* This and the three following species are very closely allied to *L. viscidum.*

12. **L. Brunonianum,** *Nees in Pl. Preiss.* ii. 92.—Stems 1½ to 2 ft. high and 1 to 1½ lines broad, quite flat or very slightly convex on one side, edged with a brown line usually resinous-scabrous or rarely quite smooth. Leaves equitant, of the breadth of the stem, the sheaths scarcely resinous. Panicle narrow and rather loose, 3 to 5 in. long, the branches and spikelets all erect. Lowest outer bract rarely above 1 in. long. Spikelets in little spikes or clusters along the branches, scarcely 2 lines long, with 1 barren flower besides the perfect one. Glumes acute or very shortly mucronate, 2 or rarely 3 outer ones shorter and empty. Scales minute at the time of flowering, lanceolate and acute with short points under the nut.—Bœckel. in Linnæa, xxxviii. 323.

W. Australia. Swan River, *Preiss, n.* 1768; King George's Sound, *Muir,* also *Drummond, n.* 42, 881, 882, 885.

13. **L. tuberculatum,** *Nees in Pl. Preiss.* ii. 90.—Stems 1½ to 2 ft. high or more, 1½ to 3 lines broad, very flat or slightly convex on one side, bordered as well as the leaves by resinous tubercles like those of *L. viscidum* but more prominent, the leaf-sheaths not usually so resinous as in that species. Panicle narrow and dense or longer and looser, 2 to 6 in. long, the spikelets usually in small spikes rarely in short dense clusters on the spikelike partial panicles or branches, all erect, and the lower branches sometimes long. Lowest bract often leaflike and several inches long, the others usually much smaller. Spikelets 2 to 2½ lines long, with 1 barren flower besides the perfect one. Glumes acute or shortly mucronate, rather broad, 2 or rarely 3 outer ones empty and shorter. Scales under the nut acuminate, with short fine points.—F. Muell. Fragm. ix. 26.

W. Australia. York district, *Preiss, n.* 1765; also *Drummond, n.* 34, 873 and 875; n. 879 with narrower stems and leaves and short panicles, and n. 116 with the spikelets densely clustered on the short branches of the panicle.

14. **L. resinosum,** *F. Muell. Herb.*—Stems 2 ft. high or more, 2 to 3 lines broad, much flattened but both sides slightly convex, very finely striate, the acute edges bordered by a very fine brown line quite continuous and smooth. Leaves similar, the brown sheathing bases very resinous. Panicle loose, compound, erect or slightly curved, rather narrow, 6 in. long or more, the spikelets singly sessile along the rather slender branches, the lower primary branches long and distant. Outer bract with a lamina rarely exceeding 1 in. Spikelets narrow, often curved or spreading, 2½ to 3 lines long, with 1 barren flower besides the perfect one. Glumes obtuse or mucronate, or the inner

ones almost acute, 2 or 3 outer ones empty and shorter. Scales minute or scarcely visible at the time of flowering, thickened, ovate, acuminate or shortly setiferous under the nut.—*Machærina resinosa*, Nees in Pl. Preiss. ii. 82; Bœckel. in Linnæa, xxxviii. 252; *Lepidosperma Sieberi*, Nees in Pl. Preiss. ii. 90, not of Kunth.

W. Australia. Swan River, *Drummond*, *1st coll.* also n. 34, 110, 803 (or 863), 883; York district, *Preiss*, *n.* 1759, 1767; Beaufort River, *Oldfield.*

The original specimens described by Nees as a *Machærina* are in flower only, when the characteristic scales of *Lepidosperma* cannot be recognised. Drummond's n. 883 with half-grown nuts, and Oldfield's in fruit, have all the appearance of belonging to the same species and confirm the transference of the plant to *Lepidosperma.*

15. **L. viscidum,** *R. Br. Prod.* 234.—Stems 1 to 2 feet high, very flat or slightly convex on one side, usually about 2 lines broad as well as the leaves, the edges scabrous with minute brown asperities or resinous exsudations, the leaf-sheaths more or less viscid. Panicle narrow, rather dense, 3 to 6 in. long, the spikelets in compound partial spikelike panicles, the lower ones sometimes long and distant but erect. Lowest outer bract sometimes long and leaf-like, or all short. Spikelets about 3 lines long, with 2 or 3 barren flowers besides the perfect one. Glumes rather acute or very shortly mucronate, 2 or 3 outer empty ones shorter and often an empty one immediately above the barren flowers. Scales scarcely conspicuous at the time of flowering, thickened under the nut and acute or acuminate but not setiferous.—Nees in Pl. Preiss. ii. 91; *L. Muelleri*, Bœckel. in Linnæa, xxxviii, 320.

N. S. Wales. Mudgee, *Taylor.*

S. Australia. Port Lincoln, *R. Brown*, *J. S. Browne;* Lofty and Barossa Ranges, *F. Mueller.*

W. Australia. Mount Clarence, King George's Sound, *Preiss*, *n.* 1766, apparently the same species but with a shorter and more dense panicle and the outer bract very long. Very near *L. resinosum*, and *L. tuberculatum*, but the glumes not so acute and the barren flowers more numerous in the spikelets examined, besides the difference in the margins of the stem and leaves.

16. **L. costale,** *Nees in Pl. Preiss.* ii. 92.—Stems 1 to 1½ ft. high, usually about 1 line broad, compressed but both sides convex, with narrow rather acute edges not resinous. Panicle narrow, rather loose, 2 to 4 in. long, the branches and spikelets all erect. Lowest outer bract rarely above 1 in. long. Spikelets in little spikes or clusters, scarcely 2 lines long, with 1 barren flower besides the perfect one. Glumes acute or very shortly mucronate, about 3 outer empty ones shorter. Scales under the nut not setiferous.—Bœckel. in Linnæa, xxxviii. 324.

W. Australia, *Drummond*, *n.* 43, 884; York district, *Preiss*, *n.* 1798, 1799; Mount Churchman, *F. Mueller.* The inflorescence is that of *L. Brunonianum*, but the stems are narrower and convex with the margins not all resinous.

17. **L. laterale,** *R. Br. Prod.* 234.—Stems often above 2 ft. high, 1½ to 3 lines broad, very flat or slightly convex on one side with very acute cutting edges. Leaves as broad and sometimes as long, but

mostly shorter. Panicle usually narrow and loose, 4 to 8 in. long, the branches not numerous, the lower ones elongated but erect, the spikelets sessile, distinct or scarcely clustered. Lowest outer bract sometimes with an erect leafy lamina of several inches but often under 1 in. the upper ones short. Spikelets about 2 lines long, with rarely more than 1 barren flower besides the perfect one. Glumes acute and sometimes produced into short points but not aristate, 3 or 4 outer empty ones gradually shorter. Hypogynous bristles or scales narrow at the time of flowering and hyaline; scales under the nut lanceolate, acuminate, tipped with seta-like points which however often wear away.—*L. lineare*, Nees in Sieb. Agrostoth. n. 9, Kunth, Enum. ii. 318, not of R. Br.; *L. concavum*, Hook. f. Fl. Tasm. ii. 91, t. 146, B, not of R. Br.

Queensland. Brisbane River, Moreton Bay, *Leichhardt*, *C. Stuart*, *Bailey* and others.

N. S. Wales. Port Jackson, *R. Brown*; Macleay River, *Beckler*; New England, *C. Stuart*.

Victoria. Murray River, Wilson's Promontory, *F. Mueller*; Little River, *Fullagar*.

Tasmania. Launceston, *Gunn*; South Port, *C. Stuart*; Swan Port, *Story*.

Var. *majus*. Stems broad and very flat. Panicle 6 in. to 1 ft. long. Spikelets rather longer and not so close. Stamens occasionally 4, style-branches frequently 4. *L. tetragynum*, R. Br. Prod. 234.—Port Jackson, *R. Brown*, *A. Cunningham* and others.

Var. *angustum*. Stems 1 to 1¼ lines broad, often slightly convex along the middle at least on one side.—*L. longitudinale*, R. Br. Prod. 234, not of Labill.; *L. angustifolium*, Hook. f. Fl. Tasm. ii. 92, t. 147, B.—Suttor Forest, *Mrs. Calvert*; Arne River, *Beckler*; New England, *C. Stuart*; Macalister's River, *F. Mueller*; Adventure Bay, *Nelson in herb. R. Br.*; Launceston, *Gunn*.

18. **L. congestum**, *R. Br. Prod.* 234.—Stems 4 to 10 in. high, flat or very slightly convex on one or both sides, 1 to 1½ lines broad, the edges not very acute. Leaves nearly as long and the same breadth, all rigid, smooth and shining. Panicle compact, narrow, 1 to 3 in. long, interrupted at the base, the spikelets in sessile clusters or in short dense compound spikes. Bracts rigid, acuminate, with subulate pungent erect points longer than the enclosed spikelets, the lowest outer bract sometimes as long as the inflorescence, the inner bracts all aristate. Spikelets about 2 lines long, with 1 barren flower besides the perfect one. Glumes acute. 4 or 5 outer empty ones gradually shorter with longer points. Hypogynous scales very minute or scarcely conspicuous at the time of flowering, but the flowers not fully developed in the specimens seen.

S. Australia. Memory Cove, *R. Brown*; Lake Hamilton, *Herb. F. Mueller*.

19. **L. globosum**, *Labill. Pl. Nov. Holl.* i. 13, *t.* 14.—Stems 1 to 1½ ft. high, much flattened but usually convex on one or both sides, with obtuse edges. Leaves often nearly as long and the same breadth. Panicle narrow, 1 to 3 in. long, compact but interrupted, the spikelets in globular clusters or very short spikes, the lower ones distant.

Lowest outer bract sometimes erect rigid and 1 in. long, sometimes all short, not aristate. Spikelets about 2 lines long, with 1 barren flower besides the perfect one. Glumes acute, about 3 outer ones gradually shorter with longer points. Scales under the nut acuminate with fine points but scarcely setiferous.—*L. læve*, R. Br. Prod. 235.

Victoria. Port Phillip, *R. Brown;* Point Lonsdale and Queenscliff, *F. Mueller;* heath near Fiztroy River, *Robertson.*

Tasmania. Brown's River, *Oldfield.*

The species requires further examination from better specimens, most of ours have the inside of the spikelets destroyed by a black fungus. I have not seen Labillardière's. Brown's have the stems flatter than the others, all may prove to be varieties of *L. laterale* or of *L. lineare.*

20. **L. lineare,** *R. Br. Prod.* 235.—Stems from under 6 in. to above 1 ft. high, about 1 line broad, compressed but both sides convex, the edges slightly prominent, acute, scabrous or nearly smooth. Leaves as long or sometimes longer and of the same breadth. Panicle narrow, from under 1 in. to 1½ in. long, with few short branches, the lower ones often spreading, the spikelets not numerous though somewhat clustered. Lower outer bract leaflike, often exceeding the inflorescence, the upper ones short. Spikelets narrow, 2 to 2½ lines long, with only 1 or sometimes no barren flower below the perfect one. Glumes acutely acuminate, about 3 outer empty ones gradually shorter. Hypogynous scales minute at the time of flowering, lanceolate and acuminate under the nut.—Hook. f. Fl. Tasm. ii. 92; F. Muell. Fragm. ix. 26; *L. Gunnii*, Bœckel. in Linnæa, xxxviii. 325.

N. S. Wales? Port Jackson, *C. Moore;* the specimens in bud only and rather doubtful.

Victoria. Wendu Vale, *Robertson;* Haidinger Range up to 5000 ft., *F. Mueller.*

Tasmania. Derwent River, *R. Brown;* near Launceston, *Gunn;* South Esk River, *C. Stuart;* Brown River, *Oldfield* (dwarf specimens scarcely 2 in. high).

Var.? *depauperatum.* Stems and leaves more slender. Panicle reduced to 3 or 4 spikelets.—New England, *C. Stuart.*

Some specimens of *L. lineare* closely resemble the *Cladium schœnoides* in outward aspect, but, besides the generic character, they may be distinguished by the leaf-sheaths much less striate.

21. **L.? aphyllum,** *R. Br. Prod.* 235.—Stems above 1ft. long and about 1½ lines broad, very flat, without any leaves except some short sheathing scales at the base. Old inflorescence narrow, 1 to 1½ in. long, almost simple, but the glumes, flowers, and nuts all fallen away from the specimen, leaving only the short rhachis of a few spikelets marked with the annular scars of the glumes, the genus therefore very uncertain.

W. Australia. Lucky Bay, *R. Brown.*

22. **L. gracile,** *R. Br. Prod.* 235.—Stems slender, 1 to 1½ ft. high, angular or flattened, with rather acute edges, under 1 line broad.

Leaves shorter and of the same breadth but flatter. Panicle narrow, 1 to 2½ in. long, the branches short or the lower ones elongated, all erect. Spikelets crowded along the branches or rarely singly scattered, about 2 lines long, with 1 barren flower beside the perfect one. Glumes acute or the lower ones obtuse and mucronate, 3 or 4 outer ones empty and shorter. Scales under the nut acuminate but not setiferous.

W. Australia. King George's Sound, *R Brown*, *Walcot*; also *Drummond*, *n.* 870, 873, 876.

L. lineare, var. *humile*, Nees in Pl. Preiss. ii. 90, *Preiss. n.* 1810 (*L. humile*, Bœckel. in Linnæa, xxxviii. 324), appears to me to be a short-stemmed form of *L. gracile*.

23. **L. semiteres,** *F. Muell.; Bœckel. in Linnæa*, xxxviii. 327.—Stems slender, 1 to 1½ ft. high, sometimes terete but usually somewhat flattened, with obtuse edges, ½ to ¾ line broad. Leaves shorter and flatter. Panicle spikelike, sometimes reduced to a simple spike as in *L. filiforme*, but more frequently branched at the base, 1 to 1½ in. long, with rather distant spikelets. Lowest outer bract with a short subulate lamina, the others more glumelike but striate. Spikelets linear-acuminate, straight or falcate, erect or spreading, about 4 lines long, with 1 barren flower besides the perfect one. Flowering glumes almost acute, about 4 outer empty ones very obtuse and gradually shorter. Scales under the nut acuminate, not setiferous.

Victoria. Queenscliff and Mount Sturgeon, *F. Mueller*; Mount Sturgeon, *Robertson.*
S. Australia. Mount Lofty Ranges and Lake Alexandrina, *F. Mueller.*

Perhaps a variety of *L. gracile*, but with much larger and fewer spikelets. Closely allied also to *L. canescens*, but the leaves, though very narrow, usually quite flat.

SECTION V. TERETICAULES. — Stems slender, terete or angular-striate, or slightly and irregularly compressed. Leaves nearly similar.

24. **L. pubisquameum,** *Steud. Syn. Glum.* ii. 158.—Stems slender but rigid, 1 to 1½ ft. high, nearly terete or angular and furrowed on one side. Leaves similar but shorter. Panicle contracted into a dense ovoid or almost globular compound cluster rarely ½ in. long, the subtending bract subulate from a sheathing base, usually erect throwing the inflorescence to one side. Spikelets densely crowded in the partial clusters, about 2 lines long in our specimens but not yet fully out, with 1 barren flower besides the perfect one. Glumes scarcely acute, 5 or 6 outer empty ones more obtuse and gradually shorter. Scales and nut not yet developed in the specimens.—F. Muell. Fragm. ix. 27.

W. Australia, *Drummond*, *n.* 250 (350 according to Steudel).

25. **L. canescens,** *Bœckel. in Linnæa*, xxxviii. 330.—Stems 1 to 2 ft. high, terete or very slightly compressed, smooth. Leaves much shorter, terete but usually grooved along the inner side. Panicle pyramidal, not very compound, 1 to 2 in. long, the branches slightly

spreading. Spikelets sessile along the branches, not very distant, erect or spreading, linear, acuminate, sometimes slightly falcate, 3 to 3½ lines long, with 1 barren flower besides the perfect one. Flowering glumes rather acute, about 4 outer empty ones obtuse or very shortly mucronate, gradually shorter. Scales under the nut acuminate, not setiferous.—F. Muell. Fragm. ix. 24.

Victoria. Near Portland, between Queenscliff and Geelong, and Genoa River, *F. Mueller.*

S. Australia. Gawler River, *Behr;* Mount Lofty Ranges and Lake Alexandrina, *F. Mueller.*

F. Mueller's specimens come very near to *L. semiteres*, but the leaves are not flattened. Behr's specimens are generally stouter, with rather larger spikelets, but one of them is quite like F. Mueller's.

26. **L. scabrum**, *Nees in Pl. Preiss.* ii. 92.—Stems 1 to 1½ ft. high, terete, prominently striate and in the typical form very scabrous. Leaves shorter, otherwise similar but more slender, and frequently somewhat flattened. Panicle dense, 1 to 2 in. long, oblong-ovoid or broad, the branches and spikelets spreading. Outer involucral bract short. Spikelets crowded along the short branches, about 2 lines long, with 1 barren flower besides the perfect one. Flowering glumes acuminate, almost acute, 3 or 4 outer empty ones shorter and more obtuse. Scales under the nut acuminate, not setiferous.—F. Muell. Fragm. ix. 27.

W. Australia. *Drummond, n.* 105, 114, 871; Swan River, *Preiss, n.* 1787, 1788.

Var. *effusum.* Stems not so scabrous and sometimes quite smooth except at the base, but always prominently striate. Panicle not so dense, 2 to 3 in. long, with spreading branches. Spikelets not so crowded and frequently curved.—Swan River, *Oldfield, Drummond, n.* 270, 869; Murchison River, *Oldfield.*

27. **L. tenue,** *Benth.*—Stems 1 to 1½ ft. high, exceedingly slender, smooth and terete but slightly furrowed on one side. Leaves filiform, slightly angular or terete, shorter than the stem. Panicle compound, 1 to 3 in. long, broad or rather narrow, with spreading or slightly recurved branches. Spikelets clustered or singly sessile along the branches, acuminate, straight or falcate, 2 lines long or rather more, with 1 barren flower besides the perfect one. Glumes obtuse or the inner ones acute, about 3 outer empty ones gradually shorter. Scales under the nut acuminate, not setiferous.

W. Australia. *Drummond, n.* 120, 121, 868, 869, 885, 886, 895; Murchison River, *Oldfield*, and, perhaps, the same but in bud only; Karri Dale, *Walcot.*

Varies very much in the panicle compact with short branches and crowded spikelets, or loose with slender branches and the spikelets rather distant.

28. **L. leptostachyum,** *Benth.*—Stems 1 to 1½ ft. high, very slender, terete and smooth or slightly angular and furrowed on one side. Leaves few, much shorter than the stem, angular or nearly terete.

Panicle 1 to 3 in. long, either reduced to a simple spike, or with 3 or 4 erect or scarcely spreading branches near the base. Outer bracts sheathing, with very short points. Spikelets singly sessile along the branches or slightly clustered, about 2 lines long or rather more, acuminate, black, mostly erect and straight, with 1 barren flower besides the perfect one. Glumes acute, the inner ones acuminate, about 3 outer empty ones gradually shorter. Scales under the nut acuminate, not setiferous.

W. Australia, *Drummond, n.* 352, 892; Kalgan River, *F. Mueller*; Forest Hill, *Muir*; Tone River, *Oldfield*; Blackwood River, *Miss Hexter.*

29. **L. leptophyllum,** *Benth.*—Stems filiform, usually about 1 ft. high, terete, prominently striate. Leaves very slender, angular or prominently ribbed, some much longer than the stem, others shorter. Panicle interrupted, 1 to 1½ in. long with few branches, the lowest usually erect, the rhachis above it very much recurved reflexed or flexuose. Lowest outer bract subulate, usually longer than the inflorescence. Spikelets clustered or singly sessile along the branches, about 2 lines long, with 1 barren flower besides the perfect one. Glumes obtuse or the inner ones scarcely acute, 2 outer empty ones shorter. Scales under the nut acuminate, not setiferous, the nut rather small.

W. Australia, *Drummond.*

30. **L. tortuosum,** *F. Muell. Fragm.* ix. 23.—Stem filiform, under 1 ft. high, nearly terete or slightly angular and furrowed on one side. Leaves often nearly as long, filiform, grooved like the stem. Spike simple, short with a very flexuose rigid rhachis. Spikelets usually 3, the lowest erect with a rigid bract often longer than itself, the others reflexed or spreading, linear, dark brown, 2 to 2½ lines long, with 1 barren flower besides the perfect one. Flowering glumes rather acute, about 3 outer empty ones very obtuse and gradually shorter. Scales under the nut acuminate, not setiferous.

Victoria. Mount Wellington, Gipps' Land, *F. Mueller.*

31. **L. flexuosum,** *R. Br. Prod.* 235.—Stems very slender, terete or nearly so, 2 ft. high or more. Leaves few, short and subulate, with long sheaths. Spike or panicle 1 to 2 in. long, branched at least at the base, the rhachis very flexuose. Sheathing bracts narrow, rigid, obtuse or with very short points. Spikelets solitary within the bracts, rather distant along the branches, at first erect but afterwards spreading, linear-terete, 4 to 5 lines long, with 1 barren flower besides the perfect one. Glumes narrow, acute or acuminate, about 3 outer empty ones shorter. Scales under the nut not aristate.—Nees in Sieb. Agrostoth. n. 43; Bœckel. in Linnæa, xxxviii. 328.

N. S. Wales. Port Jackson, *R. Brown*, *Woolls*, and many others.

32. **L. filiforme,** *Labill. Pl. Nov. Holl.* i. 17, *t.* 15.—Stems terete,

filiform but rigid, 1 to 1½ ft. high. Leaves few, much shorter, mostly reduced to rather long sheaths with short capillary laminæ. Spike simple, terminal, rarely above 1 in. long, the rhachis straight or scarcely flexuose. Sheathing bracts narrow, distant. Spikelets solitary within each bract, narrow-linear, almost terete, about 4 lines long, with 1 barren flower besides the perfect one. Glumes narrow, acute or almost obtuse, 2 or 3 outer empty ones shorter. Scales under the nut acuminate, but not setiferous.—Hook. f. Fl. Tasm. ii. 93, partly; Bœckel. in Linnæa, xxxviii. 327; F. Muell. Fragm. ix. 27.

Victoria. Mount Wellington, Gipps' Land, *F. Mueller*; Curdies Inlet, *Walter*.

Tasmania. Arthur's Lake, *Gunn*; Brown River, *Oldfield*; South Esk River, *C. Stuart*; Swanport, *Story*.

33. **L. striatum**, *R. Br. Prod.* 235.—Stems rigid, 2 ft. high or more, terete or slightly compressed and furrowed on one side, quite smooth and but very faintly striate. Leaves shorter, terete or nearly so. Panicle narrow and spikelike but interrupted, usually 3 or 4 in. long, the spikelets densely crowded on the short branches in secondary oblong compound spikes, all erect and sessile within the sheathing bracts or one of the lowest shortly pedunculate. Glume-like bracts dark brown or black, rather broad, tapering to a point, Spikelets about 3 lines long, with usually 2 or 3 barren flowers besides the perfect one. Glumes acute or acuminate, 1 or 2 outer empty ones very little shorter. Scales scarcely perceptible at the time of flowering, narrow acuminate and not very thick under the nut.—*L. confine*, Nees in Pl. Preiss. ii. 93; F. Muell. Fragm. ix. 26.

W. Australia. King George's Sound, *R. Brown*; Forest Hill, *Muir*; north of Stirling Range, *Maxwell*; Swan River, *Preiss*, *n.* 1794; also *Drummond*, *n.* 252, 380; his specimens n. 257 may be a large stout form with the panicle looser, its branches more developed, but the flowers are in too young a state to determine. Brown's specimens are in fruit with the lower spikes or branches of the panicle rather long, the stems are quite smooth, slightly grooved on one side but not distinctly striate as in *L. scabrum*, the selection of the specific name is therefore unfortunate.

Bœckeler, Linnæa, xxxviii. 329, unites this species with the *L. chinense*, Nees, which is certainly nearly allied to it as well as to the *L. Neesii*. The Chinese plant has however differently shaped bracts, much smaller hypogynous scales, and a few other distinctive characters, which would be scarcely considered as specific were it not for the geographical disseverance. At any rate Brown's name has the right of priority.

34. **L. Neesii**, *Kunth*, *Enum.* ii. 319.—Stems slender but rigid, 1 to 2 ft. high, angular or terete and grooved on one side. Leaves shorter, terete or rather flatter and more distinctly grooved. Panicle dense and spikelike, oblong or pyramidal, ¾ to 1½ in. long, brown or black, the spikelets in dense sessile clusters or short spikes within each bract. Bracts striate, acuminate, the lowest sometimes with a subulate lamina or point nearly as long as the inflorescence. Spikelets oblong-linear, 2½ to 3 lines long, with 1 barren flower besides the perfect one. Glumes narrow, acute or acuminate, 2 or 3 outer empty ones rather

shorter. Scales under the nut ovate, acuminate and sometimes shortly setiferous.—F. Muell. Fragm. ix. 27; *L. tetragonum*, Nees in Sieb. Agrostoth. n. 49, not of Labillardière.

N. S. Wales. Port Jackson, *F. Mueller*, *Woolls*, *Leichhardt*.
Victoria. Streletzki Ranges and Wilson's promontory, *F. Mueller*.

F. Mueller, Fragm. ix. 24, refers some of the specimens with shorter denser spikelike panicles to the New Zealand *L. australe*, Hook. f., but besides some minor differences, that species has never (in a number of spikelets I have examined) the second barren flower, which I have found in all the Australian species of *Lepidosperma*.

35. **L. carphoides,** *F. Muell. Herb.*—Stems slender, terete, usually grooved on one side, about 1 ft. high. Leaves similar but shorter. Panicle dense and spikelike, rarely above 1 in. long, the spikelets few in short sessile partial spikes. Sheathing bracts usually as long as the enclosed partial spikes, rigid, black, acute or produced into a subulate point or short lamina. Spikelets narrow, black, 4 to 5 lines long, with 1 barren flower besides the perfect one. Glumes narrow, rigid, acutely acuminate or almost aristate, usually 2 outer empty ones, the lowest rather shorter. Scales under the nut ovate-lanceolate acuminate.—*L. striatum*, F. Muell. Fragm. ix. 27, not of R. Br.

Victoria. Glenelg River, *Robertson*; Portland Bay and Grampians, *F. Mueller*; Moyston, *Sullivan*.
S. Australia. St. Vincent's Gulf, *F. Mueller*, *Blandowski*; Boston Point, *Wilhelmi*, Port Lincoln, *S. F. Browne*.
W. Australia. King George's Sound, *Menzies*; Point Henry, *Oldfield*

24. CLADIUM, P. Br.

(Baumea, *Gaudich.* Chapelliera, *Nees*.)

Spikelets variously paniculate, with 1 to 3 hermaphrodite flowers but usually the lowest alone fertile. Glumes few, imbricate all round, 1 to 3 or very rarely 4 outer ones empty, and usually a small one above the perfect flower, either empty or with an imperfect flower, the flowering glume not shorter than the outer empty ones. No hypogynous bristles. Stamens 3 or rarely fewer. Style deciduous, sometimes dilated at the base but continuous with the ovary; stigmatic branches 3, rarely 2, filiform. Nut ovoid or oblong, terete or obtusely triquetrous, smooth but rarely shining, crowned by the adnate base of the style often undistinguishalbe except by a slight discoloration; endocarp usually hard, exocarp either thin or more or less thickened and corky especially at the apex.—Perennials, with horizontal or creeping rhizomes. Stems sometimes tall and leafy throughout or at the base only, sometimes rushlike with all the leaves reduced to sheathing scales. Leaves, either terete, and continuous or marked with transverse septa, or vertically flattened, very rarely with the involute margins of *Gahnia*.

The genus in its typical form extends over the tropical and temperate regions of both the New and the Old World, but consists of but two or at most three species amongst which the Australian one is common over a great part of the generic area; but the more numerous section *Baumea* is probably limited to the Old World and is chiefly Australasian. Of the 15 Australian species five are also in New Zealand and one or two of these extend to some of the Pacific islands, the other ten appear all to be endemic.

SECT. I. **Eucladium.**—*Panicles densely corymbose. Outer empty glumes about* 4. *Flowers* 2, 1 *or rarely both fertile, and usually no terminal empty glume.*

Stems tall, leafy throughout. Leaves flat . . . . 1. *C. mariscus.*

SECT. II. **Baumea.**—*Panicles loose or thyrsoid or narrow. Outer empty glumes* 1 *to* 3, *and usually a small terminal glume either empty or with a rudimentary flower. Leaves chiefly at the base of the stem or none.*

Spikelets 2- or 3-flowered (flowers all apparently perfect but only one fertile).
Leaves 6 ft. (flat ?). Panicle broad, loose, with very numerous spikelets . . . . 2. *C. insulare.*
Leaves terete, transversely septate. Panicle very large, somewhat drooping. Spikelets very numerous but not clustered. Glumes not ciliate . . . . 3. *C. articulatum.*
Leaves terete, septate. Panicle erect, rigid. Spikelets scarcely clustered. Glumes ciliate . . . . 4. *C. arthrophyllum.*
Leaves terete, continuous or obscurely septate. Panicle erect, rigid. Spikelets densely clustered. Glumes ciliate . . . . 5. *C. glomeratum.*
Leaves vertically flattened. Stems much flattened. Glumes not ciliate. Western species.
Stems 3 to 4 ft. Leaves broad. Panicle often 1 ft. long . . . . 6. *C. Preissii.*
Stems 1 to 2 ft. Leaves narrow. Panicle 2 to 4 in. . 7. *C. laxum.*
Spikelets 1-flowered.
Panicles thyrsoid or loosely branched, erect. Leaves few long and erect. Spikelets numerous.
Leaves biconvex, 2 to 3 lines broad. Panicle long and loose . . . . 8. *C. riparium.*
Leaves terete, about 1 line broad. Panicle thyrsoid . 9. *C. teretifolium.*
Leaves angular or flat with a prominent midrib, 1 to 2 lines broad. Panicle thyrsoid . . . . 10. *C. tetraquetrum.*
Panicle narrow, almost spikelike or with few erect branches. Spikelets few. Nut smooth and shining.
Leaves vertically flattened but narrow. Stem under 1 ft. 11. *C. schœnoides.*
Stems leafless except short points to the sheaths, usually above 1 ft. high, rarely intermixed with a few radical stemlike leaves.
Flowering glume spreading, twice as long as the nut . . . . 12. *C. Gunnii.*
Flowering glume appressed, about as long as the nut.
Stems slender, 1 to 2 ft. high . . . . 13. *C. junceum.*
Stems stout, 3 ft. high or more . . . . 14. *C. vaginale.*
Leaves erect, terete, acute. Stem ¾ to 1½ feet . . . . 15. *C. elynanthoides.*
Spikelets densely crowded in the axils of leafy bracts, forming a long narrow almost spikelike panicle.
Leaves and bracts with involute margins and long subulate points. Nut narrow triquetrous . . . . . 16. *C. filum.*

SECTION I. EUCLADIUM.—Panicles densely corymbose. Flowers in the spikelet usually 2, one only or rarely both fertile, without any terminal empty glume or only a very minute one. Stem leafy throughout with flat leaves.

1. **C. mariscus**, *R. Br.; Kunth, Enum.* ii. 303.—Stems 3 to 6 ft. high, terete, leafy throughout and often producing tufts of leaves or leafy branches from the upper axils. Leaves nearly erect, flat, the keel and edges scabrous, the lower nearly as long as the stem. Panicles compound and corymbose in the upper axils, the whole forming a leafy panicle often above 1 ft. long. Spikelets exceedingly numerous, in small but numerous clusters, brown, ovoid or oblong, scarcely 2 lines long in the Australian specimens, longer in some northern ones, very small in others. Glumes broad, obtuse, about 4 outer empty ones gradually shorter than the flowering ones. Flowers usually 2, both hermaphrodite, or one(the lower or sometimes the upper one) male, and rarely both fertile, and I have only very rarely seen a terminal minute empty glume. Stamens 2 or rarely 3. Style-branches 3 or rarely 2. Nut nearly as long as the glumes, almost drupaceous, the exocarp thick especially the upper end and sometimes corky, the endocarp much shorter and hard.—Bœckel. in Linnæa, xxxviii. 232; Reichb. Ic. Fl. Germ. t. 287; F. Muell. Fragm. ix. 14.

Queensland. Rockhampton, *Thozet;* Bowen Downs, *Birch.*

N. S. Wales. Port Jackson and Blue Mountains, *R. Brown, Woolls* and others.

Victoria. Port Phillip, *R. Brown;* Yarra River, *Adamson, F. Mueller;* Warnamboul, *Sullivan.*

S. Australia. Tamunda, *Behr;* Lofty Range, Torrens River, *F. Mueller.*

Widely dispersed over the tropical regions of the New and the Old World and over more temperate Asia and Europe, in North America replaced by a nearly allied species.

SECTION II. BAUMEA.—Panicles loose or thyrsoid or narrow. Flowers in the spikelet solitary, or if 2 or 3 the lower one only fertile, with usually a small terminal glume either empty or with a rudimentary flower. Leaves chiefly at the base of the stem, terete or vertically flattened, or all reduced to sheathing scales (except *C. insulare*?).

In respect of general habit, inflorescence, and to a certain degree in the structure of the spikelets, the genus *Baumea*, Gaud., or *Chapelliera*, Nees, might have been retained, but all attempts to characterise the two by the shape and surface of the nut have failed, and I have followed Hooker and F. Mueller in restoring the greater part of *Baumea* to *Cladium* as a section. In some species the angles of the nut, very prominent after the nut has attained its full size, become obliterated at perfect maturity, and the external rugosity or smoothness, and the broad or small terminal discoloration caused by the remains of the adnate base of the style can only serve for specific distinctions. The distribution of the species between the two genera adopted by Bœckeler does not appear to me to be justified either by habit or character.

2. **C. insulare,** *Benth.*—" Leaves 5 to 6 ft. long; flower-stem 2 ft. higher" (*C. Moore*). Panicle much-branched, erect or rather flexuose, 6 to 8 in. long and nearly as broad. Primary bracts loosely sheathing, striate, the lowest with a sheath of about 1 in. produced into a flat point or lamina nearly as long, the upper ones gradually smaller, more acute or aristate, passing into the glumelike bracts subtending the spikelets. Spikelets very numerous and crowded but not distinctly clustered, of a rich brown, about 2 lines long. Outer empty glumes 2 or 3, acute or acuminate, scarcely aristate, the lowest the shortest. Flowers 2 or 3, all hermaphrodite but probably only one fertile, their glumes about as long as the empty ones but narrower, and a small terminal glume either empty or with a rudimentary flower. Stamens 3. Style-branches 3. Fruit not seen.

N. S. Wales. Lord Howe's Island, side of Mount Lingbird, *C. Moore*. The specimens seen consist of panicles only, but indicate a species very different from any other known to me, approaching perhaps in some respects the *C. articulatum*, though the flat points to the bracts indicate flat blades to the leaves.

3. **C. articulatum,** *R. Br. Prod.* 237.—Stems 3 to 6 ft. high, terete but marked with more or less distinct transverse septa almost disappearing below the panicle. Leaves erect, terete and stemlike, the transverse septa very prominent, the lower ones very long, the upper ones shorter with long continuous closed sheaths. Panicle very compound, somewhat nodding, 1 to 1½ ft. long, the very numerous branches and peduncles clustered within sheathing bracts, of which the lowest often produced into a terete acute septate lamina of 1 to 2 in. Spikelets exceedingly numerous, brown, about 2 lines long, with 3 to 5 hermaphrodite flowers, but usually only the lower one fertile. Glumes broad, membranous, acute, the upper ones gradually narrower and more obtuse but not shorter, 2 or rarely 3 outer ones empty and sometimes almost aristate, and the terminal one usually small empty or with an imperfect flower. Stamens 3. Style-branches 3, short. Nut obovoid, at first triquetrous, the broad obtusely conical or ovoid solid apex often as long as the nucleus or endocarp.—F. Muell. Fragm. ix. 14; *Baumea loculata*, Bœckel. in Linnæa, xxxviii. 243.

Queensland. Rockingham Bay, *Dallachy;* Bowen Downs, *Birch;* Brisbane River, Moreton Bay, *F. Mueller*, *Leichhardt* and others.

N. S. Wales. Port Jackson and Hunter's River, *R. Brown;* Paramatta, *Woolls;* New England, *C. Stuart*.

Victoria. On the Yarra, *Adamson*, *Robertson*, *F. Mueller;* Lake Terang, *F. Mueller;* Mount William Creek, *Sullivan*.

S. Australia. Onkaparinga, *F. Mueller*.

W. Australia. King George's Sound, *R. Brown*, *Maxwell*, and thence to Swan River, *Drummond*, *n.* 358 *or* 858, and Murchison River, *Oldfield*.

Also in New Zealand and in New Caledonia.

4. **C. arthrophyllum,** *F. Muell. Fragm.* ix. 14.—Very closely allied to the subseptate variety of *C. glomeratum*, and intermediate as it were between that and *C. articulatum*. Stems terete or slightly

compressed, 1½ to 2 ft. high. Leaves 2 or 3 at the base of the stem, rather long, erect, terete, irregularly septate or almost continuous, with long broad open sheaths, the upper sheaths produced into short slender acute usually septate points or laminæ, and some flowering stems entirely without the long leaves. Panicle much looser than in *C. glomeratum*, very compound, the small spikelets very numerous and approximate, scarcely clustered but erect as in *C. glomeratum* or nearly so. Glumes ciliate and nuts entirely as in that species.—*Chapelliera arthrophylla*, Nees in Pl. Preiss. ii. 77; *Baumea arthrophylla*, Bœckel. in Linnæa, xxxviii. 242.

W. Australia. Swan River, *Preiss*, *n.* 1781, according to Nees, n. 1778 in the collections seen, *Drummond*, *n. 324 or 333.*

5. **C. glomeratum,** *R. Br. Prod.* 237.—Stems 1 to 3 ft. high, terete, rather slender. Lower leaves few, erect, terete, 6 in. to 1 ft. long or more, dilated into short sheaths, a few inner ones with longer sheaths and shorter laminæ. Spikelets in ovoid or nearly globular dense clusters 3 to 4 lines in diameter, the lower clusters in a partial narrow pedunculate panicle, the upper ones on short and long peduncles clustered in the axils of the sheathing bracts, the uppermost sessile in a more compound cluster, the whole forming a narrow irregular panicle. Sheathing bracts mostly open to the base, the upper ones small and glumelike. Spikelets oblong, brown, 2 to 3 lines long. Glumes membranous, broad, ciliate, acuminate, 2 or 3 outer ones empty. Flowers usually 2, sometimes 3, all hermaphrodite or the upper one male and usually only the lower one fertile. Stamens 3. Style-branches 3. Nut ovoid-oblong, nearly as long as the glume, when unripe with 3 raised angles and crowned by the pubescent base of the style, when ripe the angles are nearly obliterated and the nut is shining (red in Brown's specimens) the base of the style scarcely distinct except as an opaque apex.—Kunth, Enum. ii. 304; Sieb. Agrostoth. n. 4; Hook. f. Fl. Tasm. ii. 94; F. Muell. Fragm. ix. 15; *C. dubium*, Nees in Sieb. Agrostoth. n. 5, Spreng. Syst. Cur. Post. 21; *Baumea rubiginosa*, and *B. Brownii*, Bœckel. in Linnæa, xxxviii. 241, 242.

N. Australia. Newcastle Range and Gilbert River, *F. Mueller*.

Queensland. Moreton Bay and Island, *M'Gillivray*, *F. Mueller*, *Bailey*; Rockhampton, *Thozet*; Bowen Downs, *Birch*.

N. S. Wales. Port Jackson, *R. Brown*, *Sieber*, *n.* 535 and many others; New England, *C. Stuart*; Archer's Station, *Leichhardt*; Liverpool Plains, *C. Moore*.

Victoria. Numerous localities from Portland and Wendu Vale to Gipps' Land, *Robertson*, *F. Mueller* and many others.

Tasmania. Abundant in clayey sandy moist places, *J. D. Hooker* and others.

S. Australia. Rivoli Bay, *F. Mueller*.

W. Australia. King George's Sound, *R. Brown*.

Var *subseptatum*. Leaves obscurely or irregularly marked with transverse septa, but the spikelets in dense erect clusters and other characters of *C. glomeratum*. To this belong several of the Victorian and Tasmanian specimens.

The species is also in New Zealand, and the *Baumea glomerata*, Gaud. in Freyc. Voy. Bot. 416, t. 29, from the Moluccas, appears from the plate to differ but very slightly from it. I have however seen no specimen.

6. **C. Preissii,** *F. Muell. Herb.*—Stems 3 to 4 ft. high, much flattened with rather acute edges below the inflorescence, the flowering branches becoming 3-angled when more than one from the same sheath. Radical leaves few, very long, vertically flat, with acute edges, 2 to 9 lines broad. Upper sheathing scales flat with very acute edges and short erect laminæ, the floral ones gradually smaller. Panicle long loose and very compound, the branches and pedicels clustered. Spikelets very numerous, distinct or scarcely clustered, of a rich brown, small but young in Preiss's specimens, ovoid-oblong and 2 to 2½ lines long when fully out, usually with 2 or 3 hermaphrodite flowers and a terminal male flower or empty glume. Glumes rather broad, acute, loosely imbricate, thin, without the cilia of *C. glomeratum,* 1 or 2 outer ones empty, the flowering ones fully as long. Stamens 3. Style-branches 3. Nut ovoid-oblong, the summit or dilated base of the style glabrous like the rest.—*Baumea Preissii,* Nees in Pl. Preiss, ii. 75; Bœckel. in Linnæa, xxxviii. 239; *C. latissimum,* F. Muell. Fragm. ix. 15.

W. Australia. Swan River, *Drummond, Preiss, n.* 1735; Port Gregory and Murchison River, *Oldfield.*

7. **C. laxum,** *Benth.*—Stems 1 to 2 ft. high, much flattened. Leaves at the base of the stem equitant, vertically flat, sometimes as long as the stem but usually much shorter, straight or falcate, acute, 1 to 3 lines broad. Panicle loose, thyrsoid, 2 to 4 in. long or sometimes the lower branches distant and pedunculate in the lower sheathing bracts, which are very flat and produced into short erect acute laminæ, the upper bracts gradually smaller and more glume-like. Spikelets erect, rather numerous but all distinct and frequently pedicellate, of a rich brown, about 2 lines long or rather more, with 2 or rarely 3 hermaphrodite flowers, one only fertile and a small male flower or empty glume above them. Glumes broadly lanceolate, acute, 2 outer empty ones shorter than the flowering ones. Stamens 3. Style-branches 3. Nut small, obovoid, crowned by the white adnate base of the style.—*Chapelliera laxa,* Nees in Pl. Preiss. ii. 76; *Baumea laxa,* Bœckel. in Linnæa, xxxviii. 245.

W. Australia. King George's Sound, *Preiss, n.* 1763, *Maxwell, Oldfield;* Swan River, *Preiss;* Murchison River, *Oldfield.* Evidently very closely allied to *C. Priessii,* although placed by Nees in a different genus on account of the adnate base of the style being more distinct, at least in the specimens seen, than in that species.

8. **C. riparium,** *Benth.*—Stems 1½ to 2 ft. high or more, much flattened. Leaves few at the base of the stem and as long, 2 to 3 lines broad, much flattened but biconvex in the lower part, with obtuse edges, ending in a flat point, those higher on the stem or sometimes all reduced to loose sheaths with short erect points, passing into the sheathing floral bracts. Panicle narrow, loosely compound, 6 to 10 in. long, the lower branches or partial panicles pedunculate in the sheathing bracts. Spikelets in erect clusters as in *C. glomeratum,* but rather smaller; glumes ciliate as in that species, but with only one herma-

phrodite flower and a male one or empty glume above it. Nut not yet ripe in the specimens seen, 3-angled, crowned by the large very pubescent base of the style.—*Chapelliera riparia*, Nees in Pl. Preiss. ii. 76; *Baumea riparia*, Bœckel. in Linnæa, xxxviii. 246,

W. Australia. *Drummond, n.* 386, and according to Nees, *Preiss, n.* 1778, but the specimens I have seen under that number belong to *C. arthrophyllum.* The *C. riparium* is however easily recognised by Nees's characters.

9. **C. teretifolium,** *R. Br. Prod.* 237.—Stems 1 to 3 ft. high, terete or slightly compressed, striate but not angular. Leaves few, rather long, terete, acute, erect, with long loose sheaths, the inner one with a short lamina. Panicle oblong or thyrsoid, dark brown, 2 to 6 in. long, erect and much branched, but usually dense and narrow. Lowest bract a loose membranous sheath with a short erect point, the others gradually smaller and more glume-like. Spikelets numerous, sessile, 2 to 2½ lines long, with 1 hermaphrodite flower. Glumes membranous, keeled, acutely acuminate, ciliate, usually 3 empty, the outer one short, and a small glume either empty or enclosing a male flower above the flowering glume and within it. Stamens 3. Nut (only seen in the Moreton Bay specimens) obovoid-globular, 1½ lines long, with many much raised longitudinal ridges, smooth for a very short space at the base, and crowned by the scarcely distinct adnate base of the style.—Bœckel. in Linnæa, xxxviii. 234; F. Muell. Fragm. ix. 15; Sieb. Agrostoth. n. 6.

Queensland. Sandy Cape, *R. Brown*; Brisbane River, Moreton Bay, *F. Mueller.*
N. S. Wales. Port Jackson and neighbourhood, *R. Brown, Woolls* and others.

Also in New Zealand.

10. **C. tetraquetrum,** *Hook. f. Fl. Tasm.* ii. 95, *t.* 149.—Stems 1 ft. high or more, scarcely compressed, striate and often angular. Leaves few, rather long, rarely above 1 line broad, rigid, somewhat flattened and striate, with a raised midrib on each side, or in larger specimens acutely 4-angled, the inner leaf reduced to a long sheath with a short lamina. Panicle oblong or thyrsoid, dark brown, 1½ to 4 in. long, dense throughout or interrupted at the base. Outer bract a loose membranous sheath with a short erect point, the others gradually smaller and more glume-like. Spikelets sessile, usually numerous, 2 to 2½ lines long, with 1 hermaphrodite flower. Glumes membranous, keeled, acutely acuminate, ciliate, usually 3 empty, the outer one short, and a small glume either empty or enclosing a male flower above the flowering glume and within it. Stamens 3. Nut obovoid, 1¼ lines long, marked with raised ridges or reticulations, shortly smooth at the base, crowned by the more or less distinct adnate base of the style.—Bœckel. in Linnæa, xxxviii. 235; *Lepidosperma tetragona,* Labill. Pl. Nov. Holl. i. 17, t. 17.

N. S. Wales? New England, *C. Stuart.* Nuts triquetrous and smooth but not quite ripe, otherwise appears the same species.

Tasmania. Common in moist places throughout the island, *J. D. Hooker* and others.

S. Australia. Mount Lofty Ranges, *F. Mueller.*

Var.? *planifolium.* Leaves flat, 1 to 2 lines broad, strongly striate, with a prominent midrib on each side. Inflorescence, bracts, 1-flowered spikelets, nuts, etc. quite as in the normal *C. tetraquetrum*, except that the spikelets are almost clustered, approaching those of *C. glomeratum.*

N. S. Wales. New England, *C. Stuart.*

Victoria. Goulburn and Upper Hume Rivers, *F. Mueller.*

F. Mueller, Fragm. ix. 15, proposes to unite this and the following *C. schœnoides* with *C. teretifolium.* They appear to me however to be constantly distinct, although nearly allied. I have not seen any authentic specimen of Labillardière's *Lepidosperma tetragonum*, but the plate quoted so exactly represents the *Cladium tetraquetrum* that I feel no doubt as to its identity. The minute hypogynous scales described by those who have seen specimens are probably the scars left by the fallen stamens, and certainly not the thickened spongy scales so universal in *Lepidosperma.*

11. **C. schœnoides,** *R. Br. Prod.* 237.—Stems 6 in. to 1 ft. or rarely 1½ ft. high, more or less flattened. Leaves at the base of the stem equitant, longer or shorter, vertically flattened, striate but without any raised midrib, rigid, straight or falcate, very acute, rarely above 1 line broad. Panicle narrow, 1 to 1½ in. long, almost spikelike but flexuose and interrupted. Lower bracts with a short sheath and erect rigid acute lamina, sometimes very short, sometimes 1 to 2 in. long, the upper bracts gradually smaller and more glume-like. Spikelets few, somewhat clustered, all sessile, about 2 lines long, 1-flowered. Glumes acute or acuminate, erect, slightly striate, scarcely ciliate, 3 outer ones empty of which the lowest short, and above the flowering glume and enclosed within it a small empty one rarely including a male flower. Stamens 3. Style-branches 3. Nut ovoid, very slightly compressed, very obtuse, dark-coloured, about 1 line long, smooth and shining when ripe, and often hanging by the persistent filaments as in several *Gahniæ.*—Hook. f. Fl. Tasm. ii. 96; *Schœnus acutus*, Labill. Pl. Nov. Holl. i. 18, t. 18; *S. falcatus*, Nees in Sieb. Agrostoth. n. 18; *Baumea schœnoides*, Bœckel. in Linnæa, xxxviii. 246.

N. S. Wales. Port Jackson and neighbourhood, *R. Brown, Woolls, C. Moore* and others.

Victoria. On the Yarra, *F. Mueller;* Mount William Flats, *Sullivan.*

Tasmania. Dry heathy places, *Gunn, Archer* and others.

W. Australia, *Drummond*, n. 331; Perongerup, *F. Mueller.*

Var. *elongatum.* Stems and leaves often 1 ft. or more, the panicle longer, the outer sheathing bract with a very short lamina.

Queensland. Moreton Island, *F. Mueller.*

12. **C. Gunnii,** *Hook. f. Fl. Tasm.* ii. 95, *t.* 148.—Stems slender but rigid, terete, from under 1 to 2 ft. high or even more, leafless except sheathing scales at the base or with one long terete stem-like leaf and occasionally a few similar radical leaves intermixed in the tuft. Panicle narrow, interrupted, with few erect branches, sometimes almost spike-like. Lower sheathing bract with a short subulate or rarely a longer leaflike point, the upper ones gradually smaller and more glume-like. Spikelets sessile, distinct, somewhat distant, 1-flowered. Glumes rather rigid, erect at first but spreading when in fruit, the flowering one narrow lanceolate, acutely acuminate, often 3 lines long,

2 outer empty ones shorter broader with fine points, the terminal empty glume very small or deficient. Stamens 3. Nut ovoid, at first prominently 3-ribbed, quite smooth and shining when ripe, tipped with the small adnate base of the style.—Bœckel. in Linnæa, xxxviii. 235; F. Muell. Fragm. ix. 15; *C. laxiflorum*, Hook. f. l. c.; *Gahnia sulcata*, F. Muell. First Gen. Rep. 20; *Schœnus punctatus*, Nees in Sieb. Agrostoth. n. 19; *S. nudus*, Steud. Syn. Glum. ii. 165; *Cladium nudum*, Bœckel. in Linnæa, xxxviii. 236.

N. S. Wales. New England, *C. Stuart.*
Victoria. Muddy Creek, Buffalo Range, between Curdie's River and the Gellibrand, *F. Mueller;* Mount William, *Sullivan.*
Tasmania. Near Formosa, *Gunn;* near New Norfolk, *Oldfield;* Mersey River and Evansdale, *C. Stuart.*
S. Australia. Mount Lofty Range, *F. Mueller.*

Sieber's specimens are smaller than the generality of the southern ones, but they agree with the common form in the spreading glumes and all other characters. The species is also in New Zealand.

13. **C. junceum,** *R. Br. Prod.* 237.—Stems slender but rigid and rush-like, from under 1 to above 2 ft. high, leafless except a few distant closed sheaths with a very small erect or spreading lamina, or sometimes only 2 or 3 sheaths at the base. Spike-like panicle short, terminal, ½ to a little more than 1 in. long; the subtending sheathing bract very small. Spikelets few, somewhat flattened, of a rich brown, about 2 lines long, sessile along the short branches, each within a broad prominently 5- or 7-nerved glume-like bract, and containing a single hermaphrodite flower. Glumes almost distichous, acute, with prominent ciliate keels, the sides membranous, 2 or 3 outer empty ones shorter, the flowering glume erect, and above it and enclosed within it a small thin-terminal glume, with usually a male flower. Stamens 3. Nut obovoid, nearly as long as the glume, very obtuse.—Bœckel. in Linnæa, xxxviii. 237; Hook. f. Fl. Tasm. ii. 95; F. Muell. Fragm. ix. 16.

Queensland. Burnett River, *F. Mueller.*
N. S. Wales. Port Jackson, *R. Brown, Woolls;* New England, *C. Stuart, Leichhardt;* Hastings River, *Beckler;* Clarence River, *Wilcox.*
Victoria. Port Philip, *R. Brown* and others; Queenscliff, Darebin Creek, *F. Mueller;* French Island, *Beveridge.*
Tasmania, *R. Brown;* abundant in wet, sandy, and heathy places in the northern parts of the island, *J. D. Hooker.*
S. Australia. St. Vincent's Gulf, *F. Mueller;* Port Lincoln, *J. S. Browne.*
W. Australia. King George's Sound, *Maxwell;* Canning, Swan, and Murchison Rivers, *Oldfield;* Busselton, *Pries.*
Also in New Zealand.

C. pauciflorum, R. Br. Prod. 237, from Port Jackson, appears to be a variety of this species, differing in the points of the leaf-sheaths being shortly subulate instead of very short and rather obtuse.

14. **C. vaginale,** *Benth.* — Stems stout, terete below the inflorescence, 3 ft. high or more, leafless except 1 or 2 long loose sheaths at the base ending in erect points, one often 6 in. long. Panicle long

narrow and interrupted, with few erect branches. Spikelets few, fully 2 lines long, resembling those of *C. junceum,* and the structure apparently the same but our specimens too far advanced. Outer empty glumes 2 or 3, acute, the keels not ciliate, the lower one rather shorter; flowering glume as long, more obtuse, with a small inner one above it enclosing an imperfect flower. Nut obovoid, obtusely triquetrous, nearly as long as the glume, at first granular, at length smooth and shining.

W. Australia, *Drummond, n.* 73; King George's Sound, *F. Mueller;* Busselton, *Pries.*

15. **C. elynanthoides,** *F. Muell. Fragm.* ix. 31.—Stems terete, rigid but slender, from under 1 ft. to 1½ ft. high. Leaves at the base of the stem shorter, rigid, erect, acute, terete and slightly channelled along the inner side, the brown sheathing bases shorter and open. Panicle narrow, consisting of few erect strict almost spike-like branches or partial panicles. Primary bracts with long half open sheaths and leaf-like terete subulate laminæ, the upper ones small, those of the partial panicles mostly glume-like. Spikelets distinct, sessile, erect, 2 to 2½ lines long. Glumes acutely acuminate, about 4 empty, the outer one rather shorter. Flowering glume as long, with a perfect hermaphrodite flower, and above and within it either a minute empty glume or a longer one with a more or less perfect but sterile flower. Stamens 3. Nut oblong, obscurely triquetrous, as long as the glumes. —*Elynanthus australis,* Nees in Ann. Nat. Hist. ser. 1, vi. 48, and in Pl. Preiss. ii. 79.

W. Australia. *Drummond, 1st coll. and n.* 113 *and* 890; York district, *Preiss, n.* 1789.

16. **C. filum,** *R. Br. Prod.* 237, *partly.*—Stems from a creeping rhizome 2 to 4 ft. high, rigid but not stout, leafy throughout. Leaves with involute scabrous margins ending in long subulate points often longer than the stem, the radical ones with dark brown more or less open sheathing bases, those on the stem with long closed sheaths, passing into the bracts. Inflorescence a long narrow very dense leafy panicle, consisting of very compound dense oblong or thyrsoid partial panicles of 1 to 1½ in., the lower ones on very short erect peduncles in the axils of distant long leaf-like bracts, the upper ones sessile in a narrow thyrsoid or spike-like panicle, the subtending bracts gradually shorter and passing into the glume-like bracts subtending the ultimate clusters and spikelets. Spikelets very numerous and crowded, 2 to 2½ lines long, narrow, pale-coloured. Empty glumes 1 or 2, narrow, acute, often minutely pubescent, the flowering one almost obtuse, and sometimes a smaller glume above it, either empty or with an imperfect sterile flower. Stamens 3. Nut narrow-oblong, triquetrous, pale-coloured, 2 to 3 lines long and not above ½ line broad.—Hook. f. Fl. Tasm. ii. 96; *Schœnus filum,* Labill. Pl. Nov. Holl. i. 18, t. 19; *Baumea longifolia,* Bœckel. in Linnæa, xxxviii. 244.

Victoria. Melbourne, *Adamson*; Portland, *Allitt*; St. Kilda and Queenscliff, *F. Mueller*.

Tasmania. Derwent River, *R. Brown*; Near Hobarton, *Gunn*; Swanport, *Story*.

S. Australia. Port Adelaide and other localities on St. Vincent's Gulf, *F. Mueller*, *Blandowski*.

The habit and inflorescence are so nearly those of *Gahnia trifida*, that the specimens of the two have often been confounded, and R. Brown's character appears to have been chiefly taken from the latter.

25. GAHNIA, Forst.

(Morelotia, *Gaudich.* Lampocarya, *R. Br.*)

Spikelets variously paniculate, with 1 hermaphrodite flower and usually 1 male flower below it. Glumes several, imbricate all round, 4 or more outer ones empty, the flowering glumes shorter, broad, obtuse and closely enveloping the flowers and nut, without any empty glume above the flower. No hypogynous bristles. Stamens 3 or more, frequently 4 to 6. Style deciduous, continuous with the ovary; stigmatic branches in the perfect flower 3 to 5 (or 3 with 1 or 2 bifid), filiform. Nut obovoid ovoid or almost fusiform, obscurely or not all 3-angled, usually smooth and shining when fully ripe, the endocarp hard, smooth or transversely rugose inside, the exocarp but little thickened.—Perennials with a hard or creeping rhizome. Stems sometimes very tall, in a few species shorter and slender. Leaves terete and furrowed along the inside or with involute margins so as to appear terete, always ending in long subulate points. Panicles either large loose and drooping, or long and erect or spike-like. Spikelets black or in a very few species brown. Filaments in some species becoming very much lengthened. Nuts in several species of a bright brown-red, in others black, grey, or almost white, and frequently after having been cut remaining hanging to the spikelet by the filaments, persistent at their base, and retained at the other end by the closely involute margins of the inner empty glumes.

The genus extends to New Zealand, the Malayan Archipelago and the Pacific islands. Of the Australian species, one appears to be general over a great part of the area, the others are all endemic.

Gahnia, generally admitted by recent botanists as generically distinct from *Cladium*, has been recently united with it by F. Mueller, and certainly, as between *Gahnia* and the section *Baumea* of *Cladium*, neither the nut nor the stamens afford any constant distinctive characters, and in some few cases the habit of species of the two groups is the same. Yet it appears to me that if the species are properly distributed, there really are two groups in which the structure of the spikelet is sufficiently distinct in principle to entitle them to rank as generic, accompanied as it is by other characters which though not absolutely constant are very general. In *Baumea*, as in most Rhynchosporeæ, the flowering glume is as long as or longer than the outer empty ones, which are usually 2 only or at most 3 in number; where there are two flowers it is the lowest one that is fertile, and *above* the flower or flowers there is almost always a small glume either empty or with an imperfect flower. In *Gahnia* there are several (4 or more) outer empty glumes of which one of the inner ones is the longest, the one or two flowering glumes are much shorter, and the fertile flower terminates the spikelet, there being no imperfect flower above it. *Baumea* never has more than three stamens, many *Gahniæ* have from 4 to 6. The peculiar foliage of *Gahnia* is exemplified in one species only of *Baumea*, some other characters, such as the black spikelets, long filaments, etc., though common in *Gahnia* are less constant. Almost all species of *Gahnia* have also a peculiarity which requires perhaps in some cases further verification, but which I have never observed in *Baumea*. There are generally two flowers, the lowest, usually very precocious, has perfect stamens with an abortive pistil, the terminal one, always later and sometimes very much so, has both organs always perfect. I believe this to be the case with the species of *Eugahnia*, but in some I may have been deceived by a certain degree of unisexuality. Although I have been able to examine a large number of specimens of most species, and the spikelets are generally exceedingly numerous, yet those of each specimen are generally in the same stage of development. In some the anthers of the lower male flower are protruding beyond the glumes, whilst the upper hermaphrodite flower is still so small as to be almost regarded as rudimentary, in others the terminal flower has its nut ripe or nearly so, and the filaments of the lower one are hanging loosely about or have entirely fallen away. It is very rarely therefore that I have been able satisfactorily to follow the development of the perfect flower from the very young bud to the nearly ripe fruit..

In the section *Lampocarya*, including the Sandwich Island *Morelotia*, Gaudich. the lower male flower is usually deficient, and although there is no imperfect flower above the fertile one, which thus as in other *Gahniæ* usually terminates the spikelet, there is sometimes a small empty glume above the flower, thus forming a group intermediate as it were between *Cladium* and *Gahnia* as suggested by Brown, but much nearer to the latter than to the former.

SECT. I. **Lampocarya.**—*Spikelets with a single terminal hermaphrodite flower or very rarely with a second male or imperfect one.—Panicle long and narrow, the spikelets in compound clusters or short spikelike branches, sessile or shortly pedunculate along the main rhachis.*

Spikelets 3 to 4 lines long. Flowering glumes broad and very obtuse. Nuts about 3 lines long. Stamens usually 6 . . . . 1. *G. aspera.*
Spikelets under 2 lines. Nuts 1 to 1¼ lines long.
  Clusters of spikes globular. Glumes aristate. Stamens 4 to 6 . . . . 2. *G. trifida.*
  Clusters of spikelets at first oblong. Glumes broad, shortly acuminate. Stamens 3, rarely 4 . . . . 3 *G. melanocarpa.*

SECT. II. **Eugahnia.**—*Spikelets with a terminal hermaphrodite flower and a precocious male or barren one below it.—Panicles (except in* G. Sieberi*) loose, narrow, thyrsoid or spreading.*

Panicles long and narrow. Leaf-sheaths not bearded.
  Spikelets densely clustered in short spikelike branches. Leaves at the base of the stem long, scabrous, with straight points . . . . 4. *G. Sieberi.*
  Spikelets very small in a long loose narrow panicle. Leaves long, scabrous, with straight points . . . 5. *G. microstachya.*
  Spikelets small in loose narrow spikelike branches. Leaves along the slender stems, smooth, with hooked or recurved points . . . . 6. *G. polyphylla.*
Panicles narrow, erect. Spikelets small. Leaf-sheaths bearded at the orifice with woolly hairs.
  Spikelets distinct or nearly so.
    Leaves smooth, with hooked or recurved points. . . 7. *G. ancistrophylla*
    Leaves smooth, with subulate erect points. . . . . 8. *G. lanigera.*
  Spikelets clustered. Leaves with erect points.
    Leaves smooth. . . . . 9. *G. aristata.*
    Leaves scabrous . . . . 10. *G. deusta.*
Panicles thyrsoid, very compound, with erect branches. Inner glumes almost hoodshaped.

Panicle very black, 3 to 6 in. long. S. Eastern species. 11. *G. radula.*
Panicle usually 1 to 1¼ ft. long. Western species . . 12. *G decomposita.*
Panicle large, with spreading or drooping branches.
Outer empty glumes acuminate or aristate, not much shorter than the inner.
Panicle dense. Nuts at length red. . . . . 13. *G. tetragonocarpa.*
Panicle loose and drooping. Nuts at length black . 14. *G. xanthocarpa.*
Outer glumes numerous, short, obtuse or slightly acuminate. . . . . 15. *G. psittacorum.*

SECTION I. LAMPOCARYA.—Spikelets with a single terminal hermaphrodite flower, or rarely with a second male or imperfect one. Panicle long and narrow, the spikelets in compound clusters or short spikelike branches, sessile or shortly pedunculate along the main rhachis.

1. **G. aspera,** *Spreng. Syst.* ii. 114.—Stems rigid, 2 to 3 ft. high. Leaves very long, with involute scabrous margins, becoming almost terete, with long subulate points. Clusters of spikelets very dense, in short compound sessile spikes in the axils of the upper or floral leaves, forming a dense spikelike slightly interrupted leafy panicle. Lower leafy bracts very long, with short sheaths, the upper gradually shorter with broad lanceolate bases, the inner bracts more glume-like. Spikelets mostly about 4 lines long, with a single hermaphrodite flower. Empty glumes 7 or 8, the outer ones narrow, acuminate or aristate, with rigid ciliate keels passing into a few inner shorter very broad and obtuse membranous ones, the flowering glume still thinner and shorter at the time of flowering. Stamens usually 6, rarely 5 or 4. Style-branches 3, all simple or one divided nearly to the base. Nut ovoid-oblong to almost globular, often 3 lines long, slightly mucronate with the base of the style, very smooth, shining and brown red when fully ripe, but in some specimens (unripe?) pale straw-coloured, at first closely enveloped in the 2 inner glumes, but at length forced out and remaining long suspended by the filaments persistent at the base of the nut and caught at the other end in the points of the longest empty glumes.—Bœckel. in Linnæa, xxxviii. 344; *Lampocarya aspera,* R. Br. Prod. 238; *Cladium asperum,* F. Muell. Fragm. ix. 12.

N. Australia. Taylor's Range, *F. Mueller.*

Queensland. Keppel Bay, Broad Sound and Shoalwater Bay, *R. Brown;* Rockingham Bay, *Dallachy;* Rockhampton, *O'Shanesy, Thozet;* Ipswich, *Nernst;* Moreton Bay, *Leichhardt.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Woolls;* Peel's Range, *A. Cunningham;* Hastings River, *Beckler;* Macleay River, *C. Moore;* Richmond River, *Mrs. Hodgkinson;* Clarence River, *Wilcox;* southward to Illawarra, *A. Cunningham.*

Also the same or a very closely allied species in New Caledonia and the Fiji Islands; and the Sandwich Island, *G. globosa,* H. Mann, or *G. mucronata,* Bœckel. may also be not really distinct.

Hexalepis scabrifolia, Bœckel. in Flora, 1875, 118, from Brisbane River, *Amalia Dietrich,* appears to me to be that state or variety of *G. aspera,* in which the nuts of a straw-colour or rarely dark brown and opaque are not yet forced out of the spikelets and remain sessile and erect. In some instances specimens from N. S. Wales as well as from Queensland with straw-coloured sessile nuts, and others with brown shining exserted hanging nuts have been sent as belonging to one species.

2. **G. trifida,** *Labill. Pl. Nov. Holl.* i. 89, *t.* 116.—Stems rigid, 2 to 4 ft. high. Leaves often as long, almost terete, with scabrous involute margins ending in long subulate points, the floral ones gradually smaller. Clusters of spikelets very dense, in short compound spikelike partial panicles, the lower ones shortly pedunculate, the upper ones sessile, forming a long narrow thyrsoid or spikelike leafy panicle like that of *Cladium filum,* but the clusters or partial panicles usually shorter and broader. Spikelets very numerous in the clusters, scarcely 2 lines long, with a single hermaphrodite flower. Glumes brown or black, broad, acutely acuminate, and the outer ones more aristate than in *Cladium filum,* with rigid erect points, often slightly scabrous on the keel and margins; outer empty ones about 4, gradually shorter, the innermost completely enveloping the flower, and rarely a small additional glume with a second imperfect flower. Stamens 4 to 6. Style-branches 3, but one often deeply divided so as to appear 4. Nut obovoid-oblong, not angled, 1 to 1½ lines long and 1 line broad, very obtuse, usually dark coloured when ripe.—*Cladium filum* (partly), R. Br. Prod. 237, Bœckel. in Linnæa, xxxviii. 233; Nees in Pl. Preiss. ii. 87; F. Muell. Fragm. ix. 14, not of Labill.; *Lampocarya hexandra,* R. Br. Prod. 238.

Victoria. Albert River, Gipps' Land and Wilson's Promontory, *F. Mueller.*

Tasmania. Derwent River, *R. Brown;* Southport, *C. Stuart;* Swanport, *Story.*

W. Australia. King George's Sound, *Muir;* Swan River, *Preiss, n.* 1780, *Drummond, n.* 901; Murchison River, *Oldfield.*

Var. *effusa.* Panicle more branched and looser.—Kojonerup, *Maxwell.*

This species, though so closely allied in structure to *G. aspera* and *G. melanocarpa,* has so much the aspect of *Cladium filum* as to have been mistaken for it by Brown and others, specimens of the two being mixed in his herbarium, and his character derived chiefly if not entirely from the *Gahnia.* He had indeed failed to recognise Labillardière's plant, which he rightly refers (from the figure and description) to his genus *Lampocarya.* After sorting out the numerous specimens of both in Mueller's and other herbaria I have found the 3 stamens and long narrow 3-angled straw-coloured nut of *C. filum,* and the 4 to 6 stamens and short obtuse obovoid dark-coloured nut of *G. trifida,* quite constant, besides that *G. trifida* may be generally distinguished without examination by the clusters of spikelets shorter, broader, more dense and more aristate than in *C. filum.*

3. **G. melanocarpa,** *R. Br. Prod.* 239.—Stems usually several feet high. Leaves very long, with involute scabrous margins, ending in long subulate points, the floral ones gradually smaller, all rigid and erect. Panicle narrow and dense, often above 1 ft. long and interrupted at the base, very compound, with erect spikelike or thyrsoid branches, the lower ones 2 to 4 in. long, the upper much shorter, very narrow when in flower, broader and denser when in fruit. Smaller bracts shortly aristate, those under the spikelets almost glume-like. Spikelets very numerous, more or less clustered, scarcely above 1½ lines long. Outer empty glumes about 3, acuminate and almost aristate, 1 or 2

inner ones also empty, and the flowering glume thinly membranous, almost hyaline, obtuse and closely enveloping the single hermaphrodite flower, without any second male flower or inner empty glume in the specimens examined. Stamens 3 or rarely 4, at length much elongated. Nut small, obovoid or ovoid, black and shining when quite ripe.—*Cladium melanocarpum*, F. Muell. Fragm. ix. 13.

N. S. Wales. Port Jackson, *R. Brown*; northward to New England, *C. Stuart*; Hastings River, *Beckler*, *C. Moore*; near Bulli, *Johnson*; southward to Nangatta Range, Twofold Bay, *F. Mueller*.

SECT. II. EUGAHNIA.—Spikelets with a single terminal fertile hermaphrodite flower and a second male, or if hermaphrodite sterile, below it and often very precocious. Panicle loose, either long and narrow or thyrsoid or very much branched and spreading or nodding, excepting *G. Sieberi*, which has nearly the inflorescence of *Lampocarya*.

4. **G. Sieberi,** *Bœckel. in Linnæa*, xxxviii. 343.—Stems terete, 2 ft. high or more. Leaves long, with involute scabrous margins, ending in long subulate points, the outer ones with short broad black open sheaths, the upper ones with long closed sheaths. Panicle very compound, narrow, thyrsoid, black, often above 1 ft. long, the branches erect, the lower ones rather long, the upper short, with numerous oblong or spikelike clusters of spikelets. Lower bracts with long subulate leafy points or laminæ, the upper ones gradually smaller and the secondary ones passing into glume-like bracts subtending the spikelets. Spikelets densely clustered, 3 to 4 or even 5 lines long. Empty glumes about 5, keeled, mucronate acuminate or the lower ones aristate, the flowering glumes shorter, obtuse, and at first very thin and hyaline. Flowers 2, both apparently hermaphrodite, but the lower precocious one always sterile, the terminal one developed usually much later and alone fertile. Stamens in all the flowers examined 4. Style-branches 3, undivided. Nut oblong, smooth, 3-angled.—*Didymonema filifolia*, Presl, Diss. 1829 and Symb. Bot. 6, t. 3, and on his authority *Epiandra teretifolia*, Presl, in Isis. 1828; *Gahnia psittacorum*, Nees in Sieb. Agrostoth. n. 13, not of Labill; *Melachne Sieberi*, Schrad., according to Nees in Ann. Nat. Hist. ser. 1, vi. 50; *Caustis Sieberi*, Kunth, Enum. ii. 307; *Cladium Sieberi*, F. Muell. Fragm. ix. 14.

N. S. Wales. Port Jackson to the Blue Mountains, *Woolls*, *Sieber*. The habit approaches that of *G. melanocarpa*, but the charactors are rather those of the following species.

5. **G. microstachya,** *Benth.*—Stems 1½ to 2 ft. high, slender, terete. Leaves few at the base of the stem and nearly as long, with scabrous involute margins, ending in long subulate terete straight points, the brown sheaths rather long and not bearded. Panicle narrow and slender, nearly 1 ft. long, the long erect slender branches mostly distant, but 2 or 3 together from the same sheath. Lower sheathing bracts with very long subulate laminæ, the upper ones small,

the secondary ones almost glume-like, but all aristate. Spikelets the smallest in the genus, all distinct, sessile or pedicellate, scarcely 1 line long. Glumes about 3 empty, acuminate, the outer 1 or 2 shorter. Flowering glumes about as long as the innermost empty one or the upper one shorter. Flowers 2, both of them hermaphrodite, the lower one sterile, the upper one (very small when the other is out) fertile. Stamens 3 or in most of the flowers examined 4. Style-branches 3, undivided. Nut oblong, obtusely triquetrous, obtuse, rather shining, about as long as the glume.

N. S. Wales. Barren situations north of Bathurst, *A. Cunningham.*
Victoria. Higher drier parts of the Avon Ranges, *F. Mueller.*

6. **G. polyphylla,** *Benth.*—Stems slender, 1 to 1½ ft. long, leafy throughout. Leaves subulate, smooth and ending in long recurved or revolute points as in *G. ancistrophylla*, but much shorter and inserted all along the stem, the sheaths oblique at the orifice and not bearded. Panicle narrow and almost spikelike, interrupted, 2 to 3 in. long, the branches short and erect. Lower bracts with subulate points, those under the spikelets glumelike and rarely aristate. Spikelets dark brown, not clustered, under 2 lines long. Glumes ovate, the outer ones acute or with short points, the upper ones obtuse. Flowers 2, hermaphrodite, the upper one alone fertile. Stamens 5 or 6. Style-branches 3, undivided. Nut not seen.

W. Australia, *Drummond, n.* 102, 253.

7. **G. ancistrophylla,** *F. Muell. Herb.* (*as a* Cladium).—Stems slender, tufted, from under 1 ft. to 1½ ft. high. Leaves chiefly at the base of the stem and sometimes nearly as long, subulate, smooth, ending in long hooked or recurved points, the brown sheaths bearded at the orifice with woolly hairs. Panicle long and narrow, sometimes occupying more than half the stem, with numerous short erect or slightly spreading branches. Spikelets dark brown, numerous, almost clustered, scarcely 2 lines long, the subtending bracts glume-like and not longer, or a few with awns slightly exceeding the spikelet. Glumes acute, scarcely aristate, 6 to 9 empty, the outer ones shorter, the flowering ones obtuse and membranous, the inner one small. Flowers 2, both hermaphrodite, the upper one alone fertile. Stamens 3 or very rarely 4. Style-branches 3, undivided. Nut not seen.

W. Australia, *Drummond, n.* 349. Upper Kalgan River, *F. Mueller.*

8. **G. lanigera,** *Benth.*—Stems slender, 8 in. to above 1 ft. high. Leaves mostly shorter, quite smooth, subulate, tapering into long fine erect points, the dark brown rigid sheaths densely bearded at the orifice with woolly hairs, the upper ones passing into the sheathing bracts. Panicle slender and narrow, 4 to 6 in. long, the branches or partial panicles all erect, the bracts under the spikelets glume-like and scarcely longer than them. Spikelets 1½ to 2 lines long, not clustered.

Empty glumes 5 or 6, narrow, acuminate, almost aristate, the outer ones scarcely shorter. Flowering glumes acute or obtuse, the inner one small and membranous. Flowers 2, both hermaphrodite, the upper one alone fertile. Stamens usually 3, but sometimes 5. Style-branches 3, undivided. Nut ovoid-oblong, smooth.—*Cladium lanigerum*, R. Br. Prod. 237; F. Muell. Fragm. ix. 14.

S. Australia. Port Lincoln, *R. Brown*, *J. S. Browne;* St. Vincent's Gulf, *F. Mueller.*

W. Australia. *Drummond;* Point Irwin, *Oldfield.* The leaves in these specimens are rather longer and the stems taller than in the South Australian ones. To them appears referrible *Cladium medium*, R. Br. l. c. from King George's Sound, but the flowers on his specimens are still very young. In Oldfield's specimens I find generally 5 stamens but in Drummond's there are 3 only as in the South Australian ones.

9. **G. aristata,** *F. Muell. Herb.* (*as a* Cladium).—Stems terete, 1 to 2 ft. high. Leaves crowded at the base of the stem, long, subulate, terete, and often chanelled but quite smooth, with long straight fine points, the brown sheaths bearded at the orifice with woolly hairs. Panicle long, narrow, almost spikelike but interrupted, the lowest branches distant, generally 2 or 3 of the partial panicles sessile or shortly pedunculate within the sheath and all erect. Lowest bract with a long brown sheath and erect subulate lamina often exceeding the inflorescence, the upper bracts shorter, those under the clusters with fine rigid awns much exceeding the spikelets. Spikelets dark brown, densely clustered, 2 to 3 lines long. Empty glumes all acuminate or aristate, the outer ones scarcely shorter, the flowering glumes shorter and obtuse. Flowers 2, both hermaphrodite, but the upper one alone fertile. Stamens 3. Nut not seen.

W. Australia. *Drummond, n.* 889; Upper Kalgan River, *Oldfield;* Upper Hay River, *F. Mueller*, *Miss Warburton.*

10. **G. deusta,** *Benth.*—Stems terete, 1 ft. high or rather more. Leaves shorter or nearly as long, with scabrous involute margins ending in long subulate erect points, the brown or black sheaths bearded at the orifice with woolly hairs. Panicle long, narrow, compound, the partial erect spikelike panicles 1 to 2 in. long, 2 or 3 together from the sheathing bracts, the lower ones pedunculate, the upper sessile. Primary bracts long and subulate with black sheaths, the uppermost and secondary ones gradually smaller and passing into the glume-like acuminate or aristate bracts subtending the spikelets, all more or less bearded on the margins especially near the base. Spikelets about 3 lines long, narrow-lanceolate. Empty glumes 3 or 4, long and narrow, acutely acuminate, slightly ciliate or bearded on the margins or nearly glabrous, the 2 inner glumes membranous, the innermost small and hyaline. Flowers 2, both hermaphrodite, but the upper one alone fertile. Stamens usually 6. Style-branches in the perfect flower 3, undivided. Nut ovoid-oblong, obtusely triquetrous, obtuse, smooth but not shining.—*Cladium deustum*, R. Br. Prod. 237; F. Muell. Fragm. ix. 14.

S. Australia. Memory Cove, *R. Brown;* Port Lincoln, *J. S. Browne;* Lake Alexandrina, *F. Mueller.*

11. **G. radula,** *Benth.*—Stems 1½ to 3 ft. high. Leaves very long, with involute scabrous margins, ending in long subulate points. Panicle compound, thyrsoid, black, usually 3 to 6 in. long, but sometimes much longer, with numerous erect branches. One or two lower bracts with long subulate leafy points or laminæ, the others gradually smaller and more glume-like. Spikelets very numerous, black, not clustered, erect, narrow, 2 to 3 lines long. Glumes altogether 6 to 8, 2 or 3 outer ones empty acute or acuminate, the inner empty ones shorter and obtuse, and the almost hood-shaped flowering ones closely enveloping the flowers. Flowers 2, both hermaphrodite, but the upper one alone fertile. Stamens 3. Style-branches 3, undivided. Nut ovoid, obtuse, 1¼ lines long, 3-ribbed, elegantly but minutely granular or at length shining.—*Cladium radula,* R. Br. Prod. 237; F. Muell. Fragm. ix. 13; *Gahnia melanocarpa,* Hook. f. Fl. Tasm. ii. 97, not of R. Br.

Victoria, chiefly about Melbourne, *Robertson, Adamson, F. Mueller* and others; French Island, *Beveridge.*

Tasmania. Derwent River, *R. Brown;* Hobarton, *Gunn;* Swanport, *Herb. F. Mueller.*

There seems to be much diversity in the degree of development of the inner glumes, but I have been unable to ascertain whether this is due to the stage of flowering of the specimens or to distinct varieties. Sieber's specimens, Agrostoth, n. 11, erroneously named by Nees *Cladium filum,* may belong to *G. radula,* but the spikelets are still too young for determination and I have seen no specimen of the species from the parts of N. S. Wales where Sieber collected.

12. **G. decomposita,** *Benth.*—Stems "in dense tussacs 6 to 9 ft. high" (*Oldfield*). Leaves very long, rigid, with involute very scabrous margins, ending in long subulate points, the floral ones gradually smaller. Panicle black or dark brown, very compound, rather loose but above 1 ft. long, the branches very numerous and erect. Lower bracts with very long subulate leaflike points or laminæ, the upper gradually smaller, those under the ultimate spikes or clusters of spikelets lanceolate, aristate-acuminate, much longer than the clusters, those under each spikelet glume-like. Spikelets very numerous, in little spikes or clusters along the branches, each spikelet about 2 lines long. Empty outer glumes 2 or 3, tapering into points, the keel ciliate or pubescent, the 2 flowering glumes much shorter, broadly obovate-spathulate, obtuse and very concave, almost hood-shaped. Flowers 2, both hermaphrodite but only the upper one fertile, and the two so close together as to be almost taken for one. Stamens in each 4 to 6. Nut obovoid, obtuse, closely enveloped in the flowering glumes till perfect maturity.—*Cladium decompositum,* R. Br. Prod. 237; *Gahnia Preissii,* Nees in Pl. Preiss. ii. 87; *Cladium Preissii,* F. Muell. Fragm. ix. 13.

W. Australia. King George's Sound, *R. Brown, Oldfield, F. Mueller;* Swan River, *Preiss, n.* 1806, *Drummond, n.* 76. In these Swan River specimens the bracts are not so broad and the awns finer, and they are therefore not so conspicuous as in the typical ones. F. Mueller refers Drummond's n. 259 to the same species, but the specimens are not in a state to be determined satisfactorily.

13. **G. tetragonocarpa,** *Bœckel. in Linnæa,* xxxviii. 347.—Stature and foliage the same as in *G. psittacorum,* and panicle as large with spreading branches and exceedingly numerous spikelets, but the spikelets often not so black or brown and broader, at first oblong, ovoid when fully out. Empty glumes 3, 4 or rarely 5, acute or aristate, the outer ones not much shorter than the inner. Flowering glumes obtuse, the inner one short, very thin and membranous. Flowers in the spikelets examined 2, the outer one male with 4 stamens, the inner one hermaphrodite with 3 stamens, but the two so close together that they appear like one flower with 7 stamens, most of them on one side of the ovary, but the number of stamens may not be constant. Style-branches 3. Nut ovoid, brown or red, at length smooth and shining.

Victoria. Muddy Creek, *F. Mueller;* Mount William Creek, *Sullivan;* Mount Imlay, *Lockhart Morton.*

14. **G. xanthocarpa,** *Hook. f. Handb. N. Zeal. Fl.* 306.—Stems 8 to 9 ft. high. Leaves 5 to 6 ft. long, with involute very scabrous margins, ending in long subulate points. Panicle large and loose, often above 1 ft. long, the very numerous branches turned to one side and more or less drooping, the lower ones often 6 in. long or more. Lower bracts with long subulate leafy points, upper ones mostly with close sheaths and short points but very variable. Spikelets very numerous, sessile but not closely packed, nearly 3 lines long. Empty glumes 6 to 8, aristate; flowering ones shorter, very thin, with short points. Flowers 2, the outer one male with a minute rudimentary pistil, the inner one hermaphrodite and fertile. Stamens 4; filaments very long. Style-branches 3, undivided. Nut ovoid-oblong, light coloured or black, smooth and shining when quite ripe.—*Cladium xanthocarpum,* F. Muell. Fragm. ix. 13.

N. S. Wales. Lord Howe's Island, *Milne, M'Gillivray, C. Moore, Fullagar.* Also in New Zealand.

15. **G. psittacorum,** *Labill. Pl. Nov. Holl.* i. 89, *t.* 115.—Stems stout, terete below the inflorescence, 4 to 8 ft. high. Leaves long, with very scabrous involute margins, ending in long subulate points. Panicle often 1 to 2 ft. long, very black, oblong or thyrsoid, often one-sided, very compound, the numerous branches spreading drooping or nearly erect. Lower sheathing bracts produced into long subulate scabrous leaflike points or laminæ, the upper ones gradually smaller. Spikelets exceedingly numerous, 2 to 3 lines long. Empty glumes in the typical forms 10 to 12, very obtuse or rarely almost acute, the outer ones very small but gradually increasing in length; flowering glumes much smaller, thinly membranous and very obtuse, the innermost one often minute. Flowers 2, but so close together as to appear within the

same glume, outer one male and very precocious, the inner one hermaphrodite and fertile. Stamens in each 4 or rarely 5 or 6; filaments moderately or very long after flowering. Style-branches usually 4 of equal length, but one of them deeply divided so as to appear 5, at least in the rather numerous flowers examined. Nut ovoid, nard, very smooth and shining, of a rich brown red when quite ripe or rarely pale straw-colour, 2 lines long in the larger Tasmanian form scarcely above half as long in some varieties.—R. Br. Prod. 238; Hook. f. Fl. Tasm. ii. 97; Bœckel. in Linnæa, xxxviii. 345; *Cladium filum* and *C. radula*, Nees in Sieb. Agrostoth. n. 11 and 12, not of R. Br.; *Cladium psittacorum*, F. Muell. Fragm. ix. 13; *G. Sieberiana*, Kunth, Enum. ii. 332.

N. S. Wales. Port Jackson, *S. White*, *Sieber*, *n.* 536, *Woolls* and others; Cowan's Creek, *Fitzgerald:* Newcastle, *Leichhardt;* Hastings River, *Beckler;* Richmond River, *Mrs. Hodgkinson.*

Victoria. Portland, *Allitt.*

Tasmania. Abundant throughout the island, *J. D. Hooker;* King's Island, *Neate.*

S. Australia. Rivoli Bay, *F. Mueller.*

W. Australia.? There is a specimen in the Hookerian herbarium marked King George's Sound, *Collie*, but as there is no other specimen in our herbaria from that well-searched locality it is probable there is some mistake.

The species, easily distinguished among all the large black panicled ones, by the number of short closely imbricate outer glumes, is very variable in the apex of these glumes more or less obtuse, in the length to which the filaments protrude after losing their anthers, and especially in the size of the nuts. In the larger typical Tasmanian form, of which I have only seen a very few N. S. Wales specimens, the nut is about 2 lines long. In the majority of the N. S. Wales specimens and a few of the southern ones the spikelets are smaller, the glumes rather less obtuse, the stamens usually but not always less conspicuous and the nuts very much smaller, but there are many intermediate specimens. It is to these small red-fruited forms that belongs the *G. erythrocarpa*, R. Br. l. c. 239, from Port Jackson. *G. leucocarpa*, R. Br. l. c. from King's Island, Bass's Straits, is nearly the same but the fruits are pale-coloured, perhaps not ripe. I should also, from the descriptions, refer to the small-fruited Port Jackson forms, the *G. Urvilleana*, Kunth, Enum. ii. 332, and *G. goniocarpa*, Steud. Syn. Glum. ii. 164.

Var.? *oxylepis.* Glumes rather fewer and more acuminate, but I can find no other difference.

Queensland. Rockingham Bay, *Dallachy;* Moreton Bay, *F. Mueller.*
N. S. Wales. New England, *C. Stuart.*

26. CAUSTIS, R. Br.

(Eurostorrhiza, *Steud.*)

Spikelets with 1 hermaphrodite flower and often 1 male one below it, narrow, sometimes unisexual by abortion. Glumes 3 or 4, imbricate all round the rhachis, acuminate or aristate, 1 or 2 outer empty ones shorter. No hypogynous bristles or scales. Stamens 3 to 6. Style slender, with a thick hard persistent base; stigmatic branches 3, filiform. Nut ovoid or oblong, crowned by the hard ovoid or oblong base of the style, sometimes as big as itself, and either continuous with it or slightly contracted under it.—Stems from a perennial rhizome with thick fibrous roots, usually leafless except sheathing-scales like those of *Restiaceæ* but closed, very rarely produced into linear-subulate leaves, more or less paniculately branched, the branches either erect and straight or numerous curved flexuose or revolute, the short sterile branchlets and peduncles clustered within each sheath. Spikelets sometimes unisexual by abortion, the males and females on separate stems though proceeding from the same rhizome.

The genus is endemic in Australia. Some specimens assume so much the aspect of some species of *Hypolæna* (Restiaceæ) as to be occasionally confounded with them in herbaria.

Spikelets (constantly ?) hermaphrodite and uniform. Beak or appendage to the nut large and distinct.
 Flowering branches erect and straight. Spikelets sessile or shortly pedunculate. Stamens usually 5 (4 to 6) 1. *C. pentandra.*
 Pedicels slender, solitary or few together in clusters of curved flexuose or involute branchlets. Stamens 3. 2. *C. flexuosa.*
Spikelets unisexual by abortion, the males and females on separate stems. Appendage to the nut small or conical and quite continuous.
 Sheathing scales not ciliate, tapering to a point. Eastern species.
  Female pedicels rigid, recurved, in clusters of flexuose or involute branchlets. Stamens 5 or 6 . . . . 3. *C. recurvata.*
  Female pedicels short, on slender erect or scarcely flexuose branches. Stamens usually 4 . . . . 4. *C. restiacea.*
 Sheathing scales and bracts truncate and ciliate, with rigid spreading or leaflike points or laminæ. Stamens 5 or 6 . . . . 5. *C. dioica.*

1. **C. pentandra,** *R. Br. Prod.* 240.—Stems 2 ft. high or more, terete below the branches, but the branches when 2 or more in a cluster flattened or excavate along the inner side with acute angles, the whole cluster terete. Flowering branches long and erect; clusters of barren ones few and often 3 to 4 in. long, erect or slightly curved. Sheathing scales usually tapering into long points. Spikelets rather numerous, erect, usually a sessile and pedunculate one from the same sheath, 6 to 8 lines long, all apparently equally fertile. Glumes rigid, minutely pubescent, with long subulate points or awns. Stamens 5 in the hermaphrodite flower, often 2 or 3 only in the male one. Persistent style-base oblong, furrowed, pubescent, larger than the nut.—Hook. f. Fl. Tasm. ii. 98; F. Muell. Fragm. ix. 19; *Eurostorrhiza Urvillei*, Steud. Syn. Glum. ii. 265.

N. S. Wales. Port Jackson, *R. Brown*, *Sieber*, *n.* 36, *J. D. Hooker;* in the north-west interior, *A. Cunningham;* Cowan's Creek, *Fitzgerald.*

Victoria. Glenelg River, *Robertson;* Mount William, *Sullivan;* Gipps' Land, *F. Mueller.*

Tasmania. Sandy heaths, northern part of the island, *Gunn;* Swanport, *Story.*

W. Australia. Lucky Bay, *R. Brown.* Some specimens of *Drummond*, *n.* 344, in a bad state, may possibly also belong to this species.

2. **C. flexuosa,** *R. Br. Prod.* 239.—Stems 1 to 2 ft. high or even more; branches numerous, solitary within the lower sheaths, clustered in the upper ones and often several times divided, the ultimate clustered branches filiform, 1 to 2 in. long or even longer, all very flexuose or incurved. Sheathing scales brown, with short erect points. Spikelets single, on pedicels mixed with the clustered branches and resembling them, very narrow linear, 3 to 4 lines long, all apparently equally fertile. Glumes narrow, acute, the lower empty ones shorter and more aristate. Persistent style-base brown, often as long as the nut and slightly contracted at the base, more or less pubescent at the time of flowering, usually glabrous on the ripe nut.—Kunth, Enum. ii. 306, partly; Guillem. Ic. Pl. Austral. t. 14; F. Muell. Fragm. ix. 19; *Restio crispatus*, Nees in Sieb. Agrostoth. n. 37.

N. Australia. Port Essington, *Armstrong.*
Queensland. Moreton Bay and Island, *F. Mueller.*
N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Woolls* and others; Cowan's Creek, *Fitzgerald;* Castle Creek, *Leichhardt;* New England, *C. Stuart;* southward to Illawarra, *A. Cunningham.*
Victoria. East Gipps' Land, *Walker.*

3. **C. recurvata,** *Spreng. Syst. Cur. Post.* 26.—Stems knotted and almost bulbous at the base, unisexual but the males and females often proceeding from the same rhizome, the males 1 to 2 ft. high, paniculately branched, the flowering branches sometimes all erect or slightly flexuose, sometimes intermixed with clusters of short flexuose or curved sterile branchlets, and occasionally a few female spikelets; the female stems usually distinct, with very numerous intricate flexuose branchlets. Male spikelets solitary or few together in a short spike sessile or on short angular or flattened peduncles within glume-like but sheathing broad striate bracts, the spikelets themselves sessile or shortly pedicellate, 5 to 6 lines long. Glumes 1 empty and 2 flowering or 2 empty and 1 flowering, the outer ones tapering into a fine point or awn, the inner one acutely acuminate. Female spikelets much shorter, solitary on short flexuose or involute pedicels. Stamens usually 5 or 6, rarely fewer, without anthers in the females. Style-branches 3, the style usually rudimentary in the males. Nut ovoid-oblong, tapering into the narrow conical persistent base of the style.—F. Muell. Fragm. ix. 19; *Restio uncinatus*, Nees in Sieb. Agrostoth. n. 35.

N. S. Wales. Port Jackson, *C. Moore, Fitzgerald;* Richmond River, *Mrs. Hodgkinson.*

Melachne Sieberi, Schrad. was originally referred by Nees in Linnæa, ix. 301, to this *C. recurvata*, a mistake which he corrected in Ann. Nat. Hist. ser. 1. vi. 50, transferring it to the *Gahnia Sieberi.*

4. **C. restiacea,** *F. Muell. Herb.*—Stems nearly 2 ft. high, knotted at the base and unisexual as in *C. recurvata*, of which this may possibly be a variety, but much more slender, and the female specimens sometimes not more flexuose than the males, the peduncles and ultimate branches as slender as in *C. flexuosa.* Male spikelets larger than in

C. flexuosa, smaller than in *C. recurvata.* Stamens in the males and filaments in the females 4 in all the specimens examined. Nut ovoid, the beak or thickened base of the style much smaller than the nut itself.

N. S. Wales. Berrima, *Miss Calvert*, where it is much used for carpet brooms. **Victoria.** Grampians, *F. Mueller.*

5. **C. dioica,** *R. Br. Prod.* 239.—Stems rigid, knotted and almost bulbous at the base, 6 in. to 1½ ft. high, unisexual, the males with short erect flowering branches and few short subulate barren ones, the female and barren stems with numerous clusters of flexuose or recurved but rigid and pungent barren branchlets. Sheathing scales rather loose, obliquely truncate and ciliate at the orifice, the upper and flowering ones with rigid spreading points of a few lines, those at the base of the stem looser, more open, and sometimes tapering into laminæ of 2 or 3 in, Male spikelets sessile or shortly pedunculate, within tubular or cupshaped pubescent bracts with rigid spreading points, the spikelets 3 to 4 lines long. Glumes acuminate or shortly aristate, slightly pubescent, the outer ones rather rigid. Stamens 5 or 6. Female spikelets smaller, all on recurved rigid flattened or angular pedicels mixed in with the clustered branchlets, the glumes more membranous than in the males. Barren filaments 5 or 6. Nut large, ovoid, tapering into the conical base of the style.—F. Muell. Fragm. ix. 19; *C. hexandra*, Nees in Pl. Preiss. ii. 88.

W. Australia. Lucky Bay, *R. Brown*; King George's Sound and neighbourhood, *Drummond, n.* 94, *Preiss, n.* 1697, *F. Mueller*; Swan River, *Preiss, n.* 1698; Murchison River, *Oldfield.*

Some male specimens from Drummond's first Swan River collection are remarkable for all the leaf-sheaths being produced into linear-subulate erect or spreading laminæ of 2 to 5 in.

27. ARTHROSTYLES, R. Br.

Spikelets with a single hermaphrodite flower or rarely with a second male flower. Glumes several, all but the uppermost 1 or 2 empty imbricate all round the rhachis. Hypogynous bristles none. Stamens or staminodia 6, filaments 3 short with perfect anthers, 3 much longer with very deciduous (or without?) anthers. Style hairy, thickened at the base, articulate and falling off below the thickening; stigmatic branches 3, recurved, densely cottony-woolly. Nut obovoid-globular, obscurely 3-angled, very obtuse.—Perennial, leafless except the sheathing scales at the base. Spikelets in a small terminal head.

The genus as above characterised is limited to the single Australian species, for the three from the Mascarene Islands, from Ceylon, and from China which have been associated with it have neither the six filaments nor the peculiar style of *Arthrostyles*, and the shape of the spikelets gives them a very different aspect. Whether they should form a distinct genus, or be associated with *Fimbristylis* from which they differ nearly as *Kyllinga* does from *Cyperus*, or whether the generic character of *Arthrostyles* should be extended so as to include them, are questions which remain to be determined by those who will work up the Indian flora. In the Chinese species I have not succeeded in finding the hypogynous bristles observed by Hance. The three filaments, short at first, become very long by the time the flowering is over and loose their anthers, but can scarcely have been mistaken for bristles.

1. **A. aphylla,** *R. Br. Prod.* 229, *not of Bœckel.*—Stems from a short thick rhizome erect, more or less tufted, rigid, more or less flattened, from very slender to about 1 line broad, 1 to 1½ ft. high, the sheathing scales at the base more or less hairy, thin and scarious at the top, the old ones dark brown and persistent round the base of the flowering stems after their own stems have perished. Terminal head of spikelets depressed-globular or hemispherical, 3 to 4 lines diameter. Outer bracts lanceolate-acuminate or almost subulate, 1 or 2 often nearly as long as the head, the others subtending the spikelets gradually passing into the glumes. Spikelets numerous and sessile in the head, 1½ to nearly 2 lines long. Glumes about 7, the innermost flowering one oblong-lanceolate, acute, membranous, obscurely 3- or 5-nerved, the others gradually shorter and broader, all empty in the spikelets examined, but according to Bœckeler there is sometimes a second male flower. Anthers of the longer stamens when present exserted, those of the shorter ones included. Style-branches recurved and very conspicuous from their white pubescence. Nut whitish, smooth or under a strong lens minutely reticulate.—*Fimbristylis aphylla*, F. Muell. Fragm. ix. 9, as to the Australian plant; *F. planiculmis*, Bœckel. in Linnæa, xxxviii. 391.

N. Australia. Croker's Island, *A. Cunningham*; near Providence Hill, *F. Mueller*; Port Essington, *Armstrong*, *Leichhardt*; Port Darwin, *Schultz*, *n.* 655.
Queensland. Endeavour River, *Banks and Solander*.

I have always found the six filaments in Schultz's specimens as in Cunningham's, F. Mueller's, and Armstrong's. R. Brown in his character does not mention the number of stamens. In most cases, by the time the style-branches are well out, the longer filaments are without anthers, but in the bud I have generally seen one at least, and once all three present.

28. REEDIA, F. Muell.

Spikelets numerous, in a long cylindrical spike enclosed in the sheaths of long leafy bracts, with 1 hermaphrodite and 1 or 2 male flowers below it. Glumes imbricate all round the rhachis, all empty except the 2 or 3 upper ones. No hypogynous scales or bristles. Stamens 6 (rarely 5 ?). Style terete, with 3 short stigmatic branches. Nut . . . .—Stems very tall, from within a dense tuft of long leaves, otherwise leafless. Spikelets small.

The single species is endemic in Australia.

1. **R. spathacea,** *F. Muell. Fragm.* i. 240, *t.* 10.—Stems from a thick woody base terete, slender but rigid, nearly 6 ft. high. Leaves very numerous and densely crowded at the base of the stem, often 2 ft. long or more, spreading, the outer ones 4 to 5 lines broad, abruptly dilated into brown imbricate bases 3 to 4 in. long and 1½ to 2 in.

broad, the inner ones narrower, dilated at the base into open sheaths, all with scabrous margins. Spike terminal, 3 to 4 in. long, ¾ in. diameter, quite enveloped in the long loose sheathing bases of 2 or 3 long leafy bracts, the inner one affixed close under the spike the others lower down. Spikelets ovate-oblong, slightly flattened, very obtuse, of a rich brown, about 3 lines long and nearly 2 lines broad, all very regular and distinct though close together. Glumes closely imbricate, broad, very obtuse, sometimes split into 2 or 3 short lobes, finely striate but not keeled or nerved, about 8 or 9 empty, the lowest very short the others gradually longer, the flowering ones the longest and thinner, the innermost containing the hermaphrodite flower very thin. Anthers long on short filaments. Ovary with about 6 prominent longitudinal ribs. Nut not seen.

W. Australia. Marshy sea-coast, between King George's Sound and the mouth of the Gordon River, *A. Gregory*; near Cape D'Entrecastreaux, *Governor Weld.*

29. EVANDRA, R. Br.

Spikelets paniculate or few in a cluster, with 2 flowers both hermaphrodite or the lower one male only. Glumes imbricate all round the rhachis, all but the 2 uppermost empty. No hypogynous scales or bristles. Stamens 12 to 20 or even more; anthers linear, with a rather long appendage. Style slender, deciduous, with 8 filiform stigmatic branches. Nut . . . .—Stems tall, leafy throughout or at the base only. Spikelets rather large.

The genus is limited to Australia.

Stem leafy throughout. Spikelets numerous in a long loose unilateral panicle. Glumes aristate . . . . 1. *E. aristata.*
Stem leafy at the base only. Spikelets 2 or 3 in a terminal cluster. Glumes acute . . . . 2. *E. pauciflora.*

1. **E. aristata,** *R. Br. Prod.* 239.—Stems from a thick rhizome 2 to 3 ft. high, obtusely triquetrous. Leaves distant, long and narrow but flat, with scabrous margins, those on the stem with black closed sheaths of about 1 in., the radical ones with long open sheaths. Panicle long, unilateral and very loose; peduncles filiform, clustered in the upper axils, some short with 1 spikelet, others longer with several spikelets, all pedicellate within sheathing bracts ending in subulate points. Spikelets oblong, 6 to 9 lines long. Empty glumes 15 or more, the outer ones very short, the inner gradually longer, very rigid, dark-coloured, with long subulate points or awns, the innermost with scarious margins; flowering glumes 2 in the flowers examined, the lower one like the inner empty ones but with broader scarious margins, the other one smaller, very thin and hyaline without any subulate point. Stamens 16 to 20 or even more, the short filaments connate at the base with the thin base of the ovary. Ovary pubescent in the free part, perfect in the upper flower, often abortive in the lower one.—Nees in Pl. Preiss. ii. 89; Bœckel. in Linnæa, xxxviii. 310; F. Muell. Fragm. ix. 18; Hook. Ic. Pl. t. 1212.

W. Australia. King George's Sound and adjoining districts, *R. Brown*, *Drummond*, *n.* 397; *Preiss*, *n.* 1779, *Oldfield*, *F. Mueller* and many others.

2. **E. pauciflora,** *R. Br. Prod.* 239.—Stems 2 to 3 ft. high, very slender, leafless except at the base. Leaves very narrow and long, gradually expanded at the base into long open striate sheaths. Spikelets in our specimens 2 or 3, sessile in a terminal cluster with a subulate bract sheathing at the base either spreading with a second shorter bract, or erect and continuing the stem making the cluster then appear lateral. Spikelet about 6 lines long. Glumes numerous as in *E. aristata,* but acute not aristate, the empty ones glabrous or the upper ones pubescent at the end; flowering glumes 2 or 3, thin, silky pubescent, each with 12 or more stamens, but one only with a pistil; appendage of the anthers not so long as in *E. aristata.*—Hook. Ic. Pl. t. 1213.

W. Australia. King George's Sound, *R. Brown;* also *Drummond*, *n.* 362.

TRIBE IV. SCLERIEÆ.—Flowers strictly unisexual in unisexual or androgynous spikelets. No utricle enclosing the females. Ovary and nut seated on a disk.

30. SCLERIA, Berg.

(Diplacrum, *R. Br.* Sphæropus, *Bœckel.*)

Flowers unisexual in unisexual or androgynous spikelets, the female flowers always solitary in the spikelet, the males usually several, placed above the female one in the androgynous spikelets. Glumes imbricate all round, 1 to 3 outer ones empty. No hypogynous bristles or scales. Stamens 1 to 3. Style slender, deciduous, with 3 filiform stigmatic branches. Nut globular or ovoid, usually white, raised on a thickened entire or more or less 3-lobed single or double disk.—Perennials or rarely annuals. Stems triquetrous, leafy, the leaf-sheaths often but not always terminating in a prominent ligula opposite the lamina. Spikelets in clusters or small corymbose or oblong panicles, terminal and axillary, or in a large compound terminal panicle.

The genus is generally spread over the tropical and subtropical regions of the New and the Old World, extending also into the temperate regions of North America. Of the thirteen Australian species five are widely spread over tropical Asia, two or three of them also in Africa, two are at least in the Malayan Archipelago or in the Pacific Islands, the remaining six appear to be endemic. No species has been found in New Zealand. The habit of the genus is very variable, but not more so than that of *Schœnus*, and although it has been divided by Nees and others into about a dozen genera, chiefly founded on the form of the disk, I have been unable to discover any distinct sectional characters beyond those which separate single species, and the following series are founded chiefly on inflorescence.

SERIES I. **Axillares.**—*Small annuals. Spikelets small, strictly unisexual, in little axillary or terminal sessile clusters, the males with* 1 *to* 3 *flowers.*

Two upper glumes of the female spikelets enclosing the nut and 3-toothed . . . . 1. *S. caricina.*

Two upper glumes of the female spikelets enclosing the nut and entire. . . . . 2. *S. pygmæa.*

SERIES II. **Laxæ.** *Weak plants under 1 ft., probably annual. Spikelets strictly unisexual, in axillary clusters or few in loose spikes, the males with several flowers.*

Spikelets in axillary clusters or small cymes. Outer persistent disk broadly cupular, inner adnate, very shortly 3-lobed . . . . 3. *S. rugosa.*
Spikelets few, small, in loose spikes. Outer disk scarcely prominent, inner adnate, shortly 3-lobed . . . . 4. *S. laxa.*

SERIES III. **Subspicatæ.**—*Perennials. Inflorescence scarcely branched. Fertile spikelets more or less androgynous or at least with empty glumes above the female flower.*

Nut tuberculate. Disk-lobes broad, membranous, spreading 5. *S. Brownii.*
Nut smooth and shining. Outer persistent disk cupular, entire; inner obsolete . . . . 6. *S. lithosperma.*
Nut tuberculate or reticulate. Disk-lobes adnate, very short broad and thick . . . . 7. *S. tesselata.*

SERIES IV. **Polystachyæ.**—*Perennials. Panicles branched, axillary and terminal. Spikelets unisexual or the fertile ones androgynous.*

Leaf-sheaths with acute angles scarcely or not at all winged.
  Panicles scarcely branched. Nut tuberculate or reticulate. Disk-lobes very short and broad . . . . 7. *S. tesselata.*
  Panicles dense, with numerous spikelets.
    Nut smooth and shining. Disk-lobes broad, obtuse, entire . . . . 8. *S. margaritifera.*
    Nut rugose or nearly smooth. Disk-lobes broad, denticulate at the end . . . . 9. *S. Græffeana.*
Leaf-sheaths distinctly winged on the angles.
  Panicles loose, not much branched. Disk-lobes acute . 10. *S. hebecarpa.*
  Panicle dense with numerous long subulate bracts.
    Disk-lobes broad, usually very obtuse . . . . . 11. *S. chinensis.*

SERIES V. **Macrostachyæ.**—*Panicle single, large, loose and very compound, on a long terminal peduncle.*

Disk-lobes obscure . . . . 12. *S. oryzoides.*

SERIES VI. **Dioicæ.**—*Spikelets strictly diæcious, small, densely clustered, in numerous short axillary and terminal panicles.*

Disk-lobes broad, membranous, spreading . . . . . 13. *S. sphacelata.*

S. setoso-asperula, Bœckel. in Flora, 1875, 120, from Lake Elphinstone, *Amalia Dietrich*, is described as having the inflorescence and other characters of the *Subspicatæ*, with narrow leaves scabrous or setulose on the upper surface, small white nuts transversely undulate or plicate, and the disk obsolete. I do not identify it with any specimen I have seen.

SERIES I. AXILLARES.—Small annuals. Spikelets small, strictly unisexual, in little axillary or terminal sessile clusters, the males with 1 to 3 flowers. Stamens 1 or 2.

1. **S. caricina,** *Benth.*—A diffuse branching annual, attaining 6 to 9 in. but often smaller. Leaves linear or linear-lanceolate, obtuse

or acute, ½ to 2 in. long, the sheaths striate and keeled. Spikelets unisexual, under 1 line long, in little dense axillary clusters sessile or very shortly pedunculate, each spikelet in the axil of a thin glume-like bract. Male spikelet: Glumes about 3, very thin and narrow; flowers usually 2, each with 1 or 2 stamens. Female spikelet: Glumes usually 3, the 2 inner ones ovate-lanceolate, acute, with an acute tooth on each side shorter than the central point; flower 1 only, without any empty glumes above it. Nut closely enveloped in the 2 enlarged several-nerved glumes, globular, reticulate and pitted, slightly hispid. Disk adnate, small, with a scarcely prominent 3-angled or 3-lobed margin.—*Diplacrum caricinum,* R. Br. Prod. 241; Kunth, Enum. ii. 360; Endl. Iconogr. t. 25; Bœckel. in Linnæa, xxxviii. 434; *D. tridentatum,* Brongn. in Duperr. Voy. Bot. t. 26.

Queensland. Endeavour River, *Banks and Solander.*

Common in tropical Asia from Ceylon to Hongkong and the Malayan Archipelago. The close connection of this plant with *Scleria* was suggested by Brown, but it was generically separated on account of the supposed homology of the 2 glumes enclosing the fruit with the perigynium or utricle of *Carex,* which however has been since shown to be a mistake. The habit of the plant is indeed very different from that of the larger species of *Scleria,* being that of *Schœnus axillaris,* but the difference is not greater than in *Schœnus,* and, as in that genus, there is too close a series of intermediate species to justify a generic separation.

2. **S. pygmæa,** *R. Br. Prod.* 240.—A dwarf branching annual, rarely exceeding 2 in. Leaves linear-lanceolate, acute, ½ to 1 in. long. Spikelets unisexual, 1 to 1½ lines long, very numerous in little axillary and terminal sessile clusters, the inner bracts subulate-acuminate. Male spikelets: Glumes 2 or 3, very narrow and hyaline, usually enclosed in the longer subtending bract; flowers 1 or 2 each with 1 or 2 stamens. Female spikelet: Glumes usually 3, the inner ones lanceolate, acutely acuminate, finely several-nerved, quite entire but dilated below the middle, with membranous margins enclosing the fruit; no empty glumes above the flower. Nut globular, about ¼ line diameter, prominently 3-ribbed, tuberculate-rugose between the ribs. Disk small, adnate, with 3 slightly prominent semi-circular lobes.—F. Muell. ix. 22; *Hypoporum pygmæum,* Nees in Linnæa, ix. 303; *Sphæropus pygmæus,* Bœckel. in Linnæa, xxxviii. 436.

N. Australia. Port Darwin, *Schultz. n.* 260.
Queensland. Endeavour River, *Banks and Solander;* Rockingham Bay, *Dallachy.*

Bœckeler, in the Linnæa, xxxviii. 434, describes under the name of *Diplacrum pygmæum* an African plant which he believes to be the same as Brown's *Scleria pygmæa,* but which has more the elongated habit of *S. caricina,* and differs essentially from both in the minute nuts with several longitudinal raised nerves or ribs between the primary ones, otherwise quite smooth, and the disk very minute or quite obsolete. He failed to recognise Brown's *S. pygmæa* in Schultz's specimens, probably from having overlooked the male spikelets which in an advanced stage of inflorescence are so much withered away as to be very difficult to find. I have seen them however in Schultz's as well as in other specimens.

SERIES II. LAXÆ. — Weak plants, under 1 ft. and probably annual. Spikelets strictly unisexual, in axillary clusters or few in loose spikes, the males with several flowers, the females without empty glumes above the flower. Stamens usually 2.

3. **S. rugosa,** *R. Br. Prod.* 240.—Weak and branching, apparently annual, 6 in. to 1 ft. high. Leaves grass-like, the lower ones sometimes longer than the stem. Clusters of spikelets axillary and terminal, sometimes almost sessile, solitary but compound, and often with 1 or 2 pedunculate clusters or flowering branches with the sessile one in the lower axils, the foliage and inflorescence either sprinkled with short hairs or quite glabrous. Male spikelets stipitate in the clusters, about 1 line long, with several flowers. Outer empty glumes usually 3, acuminate, with ciliate keels; flowering glumes very narrow and hyaline, not exceeding the outer empty ones. Stamens 1 or 2 in each flower. Female spikelets nearly sessile. Glumes usually 3, acuminate, with ciliate hirsute keels, about 1½ lines long. No empty glumes above the flower. Nut globular, pitted and rugose. Disk double, the external persistent one broadly cupulate and entire, the inner adnate one with an undulate or obtusely 3-lobed margin.—F. Muell. Fragm. ix. 22.

N. Australia. Port Darwin, *Schultz*, *n.* 80; Upper Victoria River, *F. Mueller*.

Queensland. Endeavour River, *Banks and Solander*, Rockingham Bay, *Dallachy*.

This species closely connects the preceding with the following ones.

4. **S. laxa,** *R. Br. Prod.* 240.—Stems weak and slender, 6 in. to 1 ft. high. Leaves long and narrow, chiefly at the base of the stem, the floral ones similar but shorter. Spikelets unisexual, not numerous, in a terminal almost simple loose and interrupted spike, and a few similar spikes on long filiform peduncles in the axils of distant leafy bracts. Male and female spikelets equally sessile or nearly so, in little clusters usually of 2 males and 1 female, all under 2 lines long. Male flowers several, the glumes very narrow. Stamens usually 2. Glumes in the female spikelet 3 or 4, broader than in the males, membranous, acuminate, no empty ones above the flower. Nut ovoid-globular, white, reticulate. Disk adnate, with 3 short undulate lobes, at first sometimes rather acute, but thickened and obtuse with recurved sinuses under the ripe nut, the outer disk not prominent.—F. Muell. Fragm. ix. 21; *S. Novæ-Hollandiæ*, Bœckel. in Flora, 1875, 120 (from the char. given).

N. Australia. North Coast, *R. Brown*.

Queensland. Rockingham Bay, *Dallachy*; Brisbane River, *Bailey*; Port Mackay, *Amalia Dietrich* (if correctly identified.)

SERIES III. SUBSPICATÆ. — Perennials. Inflorescence scarcely branched. Fertile spikelets more or less androgynous, or at least with empty glumes above the female flower. Stamens 1 to 3.

5. **S. Brownii,** *Kunth, Enum.* ii. 349.—Stems slender, 1 to 2 ft. high. Leaves long and narrow, rather rigid, very scabrous or nearly smooth, the sheaths often pubescent and slightly fringed at the orifice, the floral leaves or bracts similar, the upper ones shorter, but all leaf-like and distant. Spikelets androgynous or male, 2 to near 3 lines long, several together in axillary and terminal sessile or pedunculate clusters. Outer empty glumes 2 or 3, lanceolate, acuminate, the one under the female flower much dilated, very narrow under the males. Male flowers very few above the female in the androgynous spikelets, each with 1 or 2 stamens, more numerous with 3 stamens each in the male spikelets. Nut ovoid or globular, 3-ribbed, more or less tuberculate or granular, tipped with the short base of the style. Disk with 3 broad spreading membranous obtuse or truncate lobes, and often shortly aristate within or below the lobes or both.—Bœckel. in Linnæa, xxxviii. 453; F. Muell. Fragm. ix. 21; *S. distans*, R. Br. Prod. 240, not of Poir.

N. Australia. Arnhem South Bay, *R. Brown;* Port Darwin, *Schultz, n.* 37, 782.

Queensland. Rockhampton, *O'Shanesy* and others; Nerkool and Herbert's Creeks, *Bowman;* Oxley's Station, *Leichhardt*; Dawson and Burnet Rivers, *F. Mueller*.

S. pallidiflora, Bœckel. in Flora, 1875, 119, from Gladstone, *Amalia Dietrich*, is probably referrible to *S. Brownii*.

6. **S. lithosperma,** *Willd.; Kunth, Enum.* ii. 349.—Stems slender, 1 to 1½ ft. high. Leaves very narrow linear and rather long, sometimes almost filiform, the sheaths acutely 3-angled, usually pubescent on the sides and slightly fringed at the orifice, the upper ones passing into distant leafy bracts gradually shorter and more subulate. Peduncles axillary and terminal, the lowest often much elongated, the upper ones very short, each bearing 1 to 4 clusters of 2 or 3 spikelets or the upper spikelet sessile and solitary within the bract. Spikelets 1½ to 2 lines long, more or less androgynous or male. Outer glumes spreading, acuminate, 2 empty, the 3rd broader with a female flower, and above it several sometimes numerous narrower glumes with 1 or 2 stamens in each; in the male spikelets the glumes and flowers more numerous and the stamens often 3. Nut ovoid, smooth and shining or rarely slightly tuberculate. Outer persistent disk broadly cupular, entire, inner adnate one reduced to a brown ring or quite obsolete.—Bœckel. in Linnæa, xxxviii. 451; F. Muell. Fragm. ix. 21; *S. capillaris*, R. Br. Prod. 240; Kunth, Enum. ii. 349; *Hypoporum capillare*, Nees in Linnæa, ix. 303; *H. Sieberi*, Nees in Sieb. Agrostoth. n. 97.

N. Australia. Arnhem S. Bay, *R. Brown;* Port Darwin, *Schultz. n.* 6, 171 266, 817.

Var. *linearis*. Leaves rather broader, inflorescence more branched with more numerous spikelets, but the structure and disk the same.

Queensland. Brisbane River, *F. Mueller*.

The species is widely spread over tropical Asia, the var. *linearis* corresponds nearly to Thwaites' var. *β*. from Ceylon or Bœckeler's var. n. 1.

SERIES III. POLYSTACHYÆ.—Perennials. Panicles branched, axillary and terminal, sometimes nearly simple in *S. tesselata*. Spikelets strictly unisexual, or the fertile ones androgynous. Stamens usually 3.

7. **S. tesselata,** *Willd.*; *Kunth*, *Enum.* ii. 343.—Stems 1 to 2½ ft. high, rather slender. Leaves mostly 2 to 3 lines broad, the sheaths acutely 3-angled and sometimes narrowly winged, quite glabrous, produced into a short rounded glabrous or shortly ciliate membrane or ligula. Panicles axillary or terminal, the terminal one narrow, 1 to 2 in. long with few erect branches, the axillary ones few, small, distant, pedunculate, the subtending bracts leaflike. Spikelets not numerous, unisexual. Males narrow, fully 2 lines long, with numerous flowers. Glumes narrow, obtuse, closely enveloping each other, 2 or 3 outer ones empty or rather shorter. Stamens 3. Flowering glume of the female spikelets broad, almost acute, 2 or 3 outer empty ones shorter, and 1 or 2 small narrow empty ones above the flower. Nut white, tuberculate or reticulate and sometimes slightly pubescent. Disk adnate, with very short broad obtuse lobes, the outer persistent one only slightly prominent, or rarely broader and somewhat cupular.—Bœckel. in Linnæa, xxxviii. 470.

Queensland. Brisbane River, *F. Mueller*.

Var. *debilis*. Stems weak and slender. Leaves narrow. Panicles small, on long peduncles.—Rockingham Bay, *Dallachy*.

The species is widely spread over tropical Asia. It seems to vary in the breadth of the foliage as well as in the degree of development of the disk, which I do not find quite the same in different spikelets of the same specimen. It should probably include *S. uliginosa*, Hochst. and *S. Steudeliana*, Miq., and perhaps some others distinguished by Bœckeler.

S. mackaviensis, Bœckel. in Linnæa, 1875, 119, from Port Mackay, *Amalia Dietrich*, must be very near to if not identical with *S. tesselata*.

8. **S. margaritifera,** *Willd.*; *Kunth*, *Enum.* ii. 341.—Stems stout, 2 to 3 ft. high, the angles and margins of the leaves scabrous, otherwise glabrous. Leaves long, 3 to 5 lines broad, the sheaths acutely 3-angled but not winged; in the upper part of the stem 2 or 3 leaves often close together, the others distant, the floral ones or leafy bracts gradually smaller. Panicles axillary and terminal, loosely pyramidal, 2 to 3 in. long, forming a narrow leafy interrupted panicle of 1 ft. or more Inner bracts small. Spikelets scarcely 1½ lines long, unisexual, singly sessile along the branches, the females usually nearer the base, the males many-flowered. Stamens 2 or 3. Nut nearly globular, white, smooth

and shining or slightly reticulate. Disk adnate with 3 broad obtuse lobes, the outer one not prominent.—R. Br. Prod. 240; Bœckel. in Linnæa, xxxviii. 511; F. Muell. Fragm. ix. 21.

Queensland. Endeavour River and Bay of Inlets, *Banks and Solander*; Rockhampton, *Thozet;* Fitzroy Island, *Walter.* The species is also in the Pacific islands and perhaps in the Malayan Archipelago.

9. **S. Græffeana,** *Bœckel. in Flora,* 1875, 121 (from the char. given).—Stature and habit of *S. margaritifera,* the leaves similarly collected 2 or 3 together in the upper part of the stem and the sheaths not winged, but the leaves longer and narrower and as well as the angles of the stem quite smooth or scarcely scabrous. Panicles ovate-pyramidal, dense or rather loose, the terminal one 2 or 3 in. long, and 2 or 3 distant axillary ones smaller. Outer bracts leaflike; inner ones not exceeding the spikelets or here and there a subulate one rather longer. Spikelets numerous, unisexual, the males about 2 lines long. Stamens usually 2. Nut globular, white, tubercular- rugose or nearly smooth, glabrous or sparingly pubescent. Outer persistent disk at length almost cupular, inner adnate disk with 3 broad lobes denticulate at the end.

N. Australia. Near Providence Hill, *F. Mueller.*
Queensland. Cape York, *M'Gillivray;* Cape Grafton, *A. Cunningham;* Port Mackay, *Amalia Dietrich* (if correctly identified).

10. **S. hebecarpa,** *Nees; Kunth, Enum.* ii. 357.—Stems 1 to 3 ft. high, glabrous as well as the foliage. Leaves 2 to 3 lines broad, the sheaths more or less winged on the angles. Terminal panicle 1½ to 3 in. long, not much branched, with 1 or sometimes 2 leafy bracts and a second smaller panicle on a long peduncle in the axil of a leaf much lower down. Inner bracts small and subulate. Spikelets usually 3 together in little cymes or clusters, 2 male and 1 female, the males narrow, under 2 lines long, with numerous flowers. Stamens 3. Flowering glume of the females very broad, about 1 line long, with 2 or 3 outer empty ones. Nut globular or ovoid, white, smooth and shining but pubescent, under 1 line long. Disk adnate, with 3 acute lobes.—Bœckel. in Linnæa, xxxviii. 478; F. Muell. Fragm. ix. 21; *S. Dietrichiæ,* Bœckel. in Flora, 1875, 121, (from the char. given).

N. Australia. Port Darwin, *Schultz, n.* 816.
Queensland. Wide Bay, *Bidwill;* Rockingham Bay, *Dallachy.*
N. S. Wales. Richmond River, *Danger.*

Widely spread over tropical Asia. Some specimens of Dallachy's closely resemble this species, but the disk-lobes appear to be obtuse, they are however scarcely sufficient to characterise as a distant species.

11. **S. chinensis,** *Kunth, Enum.* ii. 357.—Stems 2 to 3 ft. high, glabrous as well as the foliage. Leaves 2 to 5 lines broad, the sheaths more or less winged on the angles, the ligula membranous, often 3 to 5 lines long, but on other leaves short. Terminal panicle dense, much

branched, 2 to 4 in. long, and 1 or 2 smaller axillary ones lower down. Outer bracts or floral leaves long and leaflike and numerous subulate-acuminate bracts within the panicle protruding far beyond the spikelets. Spikelets numerous and crowded, unisexual, usually 1 female and 1 or 2 males in each cluster, the males narrow about 2 lines long, the females with much broader glumes. Nut globular, white, irregularly tuberculate-rugose and sometimes sparingly pubescent. Disk adnate, with 3 broad lobes from very obtuse to almost acute; outer disk scarcely prominent.—Bœckel. in Linnæa, xxxviii. 486; F. Muell. Fragm. ix. 20.

Queensland. Rockingham Bay, *Dallachy*; Dunk and Goold Islands, *M'Gillivray*; Lower Herbert River, *Herb. F. Mueller.*

Also in the Malayan Archipelago and South China. It is very closely allied to *S. scrobiculata*, Nees, and to *S. malaccensis*, Bœckel. in which however the leaf-sheaths are not winged.

SERIES V. MACROSTACHYÆ.—Panicle single, large, loose and very compound, on a long terminal peduncle.

12. **S. oryzoides,** *Presl; Kunth, Enum.* ii. 356.—Stems from a creeping rhizome, tall, stout, glabrous as well as the foliage. Leaves erect, the lower ones long, $\frac{1}{2}$ to $\frac{3}{4}$ in. broad, longitudinally plicate. Panicle terminal, pedunculate above the last leaf, ovate, 6 to 8 in. long, very compound, with numerous erect or slightly spreading slender branches. Outer bract short and subulate, the others very small. Spikelets singly sessile along the branches, about 2 lines long, all apparently unisexual in the Australian specimens, but often androgynous in Indian ones, the subtending bracts small, lanceolate, glume-like, keeled, with short points. Glumes of the female spikelets ovate-lanceolate, acute or almost obtuse, 3 or 4 outer empty ones gradually shorter and a small empty one above the flower. Glumes of the males narrower, numerous and closely imbricate. Stamens 3. Nut (in the Indian specimens) globular, white, smooth and shining. Disk adnate, thick but scarcely prominent, obscurely 3-lobed.—Bœckel. in Linnæa, xxxviii. 492.

N. Australia. Between M'Adam Range and Providence Hill, *F. Mueller;* Also in tropical Asia, and the same or a closely allied species in tropical Africa. The Australian specimens are in flower only but agree very well with Indian ones.

SERIES VI. DIOICÆ.—Spikelets strictly diœcious, small, densely clustered in numerous short axillary and terminal panicles.

13. **S. sphacelata,** *F. Muell. Fragm.* ix. 20.—Stems $1\frac{1}{2}$ to 3 ft. high, glabrous as well as the foliage. Leaves long and narrow, the recurved margins and keel scabrous, the sheaths acutely 3-angled but not winged, and no ligula. Panicles numerous, 1 to near 2 in. long, terminal and in the upper axils, the lower ones pedunculate and distant, the spikelets in the male plant very numerous and densely clustered on

the short branches of the partial panicles, rather less numerous but still clustered in the female. Outer bracts or floral leaves long and distant, the upper ones gradually shorter and more approximate. Spikelets scarcely 2 lines long. Glumes in the males numerous, obtuse or nearly so, 3 or 4 outer empty ones more acute or acuminate, with dark brown margins and keels or brown all over. Stamens 3. Female spikelets rather larger, with 3 or 4 acute or acuminate glumes, and no empty one above the flower. Nut globular, tuberculate, more or less pubescent. Disk with 3 very broad spreading membranous truncate lobes.

Queensland. Suttor River, *F. Mueller;* Rockingham Bay, *Dallachy;* Rockhampton, *O'Shanesy, Thozet* and others; Springsure Cliffs, *Wuth;* Brisbane River, *Bailey;* Archer's Creek, *Leichhardt.*

Very different in aspect as well as in character from any other *Scleria* known to me. The male specimens in herb. F. Mueller are numerous, the females very few.

TRIBE V. CARICEÆ.—Flowers strictly unisexual, in unisexual or androgynous spikelets, the females enclosed in an utricle or perigynium.

31. UNCINIA, Pers.

Flowers unisexual, in a single terminal androgynous spikelet, male at the top. Glumes imbricate all round the rhachis. Stamens in the males 3 or rarely fewer, without hypogynous bristles or scales. Ovary in the females enclosed in a bottle-shaped utricle or perigynium contracted at the top, with a small oblique or 2-toothed orifice and at the base of the ovary within the utricle is a bristle (a barren pedicel) projecting beyond it and ending in a rigid hook. Style protruding, with 3 filiform stigmatic branches. Nut more or less 3-angled, enclosed in the somewhat enlarged persistent utricle.—Habit of *Carex* from which the genus differs only in the hooked bristle projecting from the utricle.

The genus extends to New Zealand and extra-tropical South America, and one species is in Mexico and the West Indies.

Leaves filiform. Spikelets loose, 3 to 9 lines long	1. *U. tenella.*
Leaves linear. Spikelets dense, oblong, 9 to 12 lines long .	2. *U. compacta.*
Leaves and stems elongated. Spikelets narrow, 1½ to 2 in. long.	
Leaves narrow-linear. Male flowers 3 or 4. Glumes all acute or obtuse	3. *U. riparia.*
Leaves almost filiform. Male flowers rather numerous. Lowest glume produced into a filiform leaf	4. *U. debilior.*

1. **U. tenella,** *R. Br. Prod.* 241.—Stem and leaves filiform, in dense tufts, rarely above 6 in. high. Spikelet loose, narrow-oblong, 3 to 9 lines long, with about 6 to 12 female flowers and 3 or 4 males at the top. Male glumes small, narrow, very thin. Stamens 2 only in all the flowers examined. Female glumes lanceolate, acute, membranous, with a prominent keel, about 1½ lines long. Utricle about as long as

the glume, the orifice with 2 small obtuse teeth. Hooked bristle nearly twice as long. Nut narrow, 3-angled, nearly as long as the utricle.—Hook. f. Fl. Tasm. ii. 102, t. 152 A; F. Muell. Fragm. viii. 151; *Carex tenella*, Poir. Dict. Suppl. iii. 282.

Victoria. Sealer's Cove, Dandonong Mountains, Mount Baw-Baw, source of the Yarra and Goulburn and Upper Tyers Rivers, *F. Mueller*.

Tasmania. Derwent River, *R. Brown*; moist woods, Hobarton and Black River, *Gunn*; Western mountains, *Archer*; Mount Wellington, *Gulliver*; Southport, *C. Stuart*. Some specimens from near Lake St. Clair, *F. Mueller*, are depauperated with only 3 or 4 female flowers.

The New Zealand *U. filiformis* is very closely allied to this species.

2. **U. compacta,** *R. Br. Prod.* 241.—Stems in open situations 2 or 3 in. high, rigid, with brown inflorescence, in shady moist localities 6 in. to near 1 ft. long, with a pale-coloured spikelet. Leaves as long or shorter, rarely much above 1 line broad. Spikelet oblong, dense or slightly interrupted at the base, ¾ to 1 in. long, the lowest 1 or 2 glumes or bracts sometimes produced into a leaflike point. Glumes otherwise broadly lanceolate, acute, membranous with a green keel, often 3-nerved, 2½ to 3 lines long. Stamens 3. Utricle shorter than the glume, tapering at the base and at the top, 3-angled, the sides faintly striate or nerveless. Hooked bristle about twice as long as the utricle, but occasionally 1 or 2 of the lowest elongated and instead of the hook bear a male and a female flower with small glumes. Nut shorter than the utricle, 3-angled.—Hook. f. Fl. Tasm. ii. 103, t. 153 B; F. Muell. Fragm. viii. 152; *Carex compacta*, Poir. Dict. Suppl. iii. 282.

Victoria. Mount Baw-Baw, at an elevation of 3000 to 4000 ft., *F. Mueller*.

Tasmania. Derwent River, *R. Brown*; summit of Mount Wellington, *Gunn*, *F. Mueller*; Mount Perouse, *C. Stuart*; Western Mountains, *Archer*; Mount Field East, *F. Mueller*.

U. nervosa, Boott in Hook. f. Fl. Tasm. ii. 102, t. 153 A, is founded on a single specimen which appears to me to be a narrow-leaved state of *U. compacta*.

U. divaricata, Boott, from New Zealand, referred to *U. compacta* in Hook. f. Handb. N. Zeal. Fl. 309, differs slightly in the many-nerved glumes and rather longer utricles.

3. **U. riparia,** *R. Br. Prod.* 241.—Stems slender, 1 to 1½ ft. high. Leaves as long or longer, linear, about 1 line broad. Spikelet narrow, 1½ to 2 in. long, the male flowers 3 or 4 only at the top, the females rather distant in the lower part, closer together higher up. Glumes acute or almost obtuse, about 2 lines long, with a prominent keel. Stamens 3. Utricle longer than the glume, acuminate, contracted into a stipes at the base, many-nerved. Hooked bristle not twice as long as the utricle. Nut shorter.—Hook. f. Fl. Tasm. ii. 102, t. 152 B.; F. Muell. Fragm. viii. 152; *Carex riparia*, Poir. Dict. Suppl. iii. 282.

Victoria. Upper Hume River and Mount Kosciusko at an elevation of 3000 to 4000 ft., *F. Mueller*.

Tasmania. Derwent River, *R. Brown*; Cuming's Head, *Archer*; Southport, *C. Stuart.*

4. **U. debilior,** *F. Muell. Fragm.* viii. 151.—Stems filiform, 6 in. to above 1 ft. long. Leaves usually longer, very narrow linear, tapering into long filiform points. Spikelet linear, slender, 1½ to 2 in. long. Glumes rather distant especially the lower ones, narrow linear-lanceolate, 1½ to 2 lines long, 3-nerved, the lowest produced into a filiform leaf often several inches long. Male flowers rather numerous. Stamens 3. Utricle narrow, exceeding the glume, but not seen far advanced. Hooked bristle nearly twice as long as the glume.

N. S. Wales. Lord Howe's Island, summit of Mount Gower, *Fullagar.* Very closely allied to the New Zealand *U. leptostachya*, differing slightly in the more acuminate glumes.

32. CAREX, Linn.

Flowers unisexual, in unisexual or androgynous spikelets. Glumes imbricate all round the rhachis. Stamens in the males 3 or rarely fewer, without hypogynous bristles or scales. Ovary in the females enclosed in a bottle-shaped or inflated utricle or perigynium, contracted at the top, with a small oblique or 2-toothed orifice, and at the base of the ovary within the utricle is often a bristle (a barren pedicel) usually very small, not hooked, rarely protruding from the utricle and entirely wanting in many species. Style protruding with 2 or 3 filiform stigmatic branches. Nut flattened or 3-angled, enclosed in the somewhat enlarged persistent utricle.—Perennials with grass-like leaves, mostly radical or on the lower part of the stem. Spikelets either solitary and terminal or few, one terminal the others more or less distant, sessile or pedunculate, or many in a terminal panicle or compound spike. Male flowers collected together in the terminal spikelet or at the upper end rarely at the lower end of the androgynous spikelets. Floral bracts often leaflike under the lower spikelets or branches of the panicle, usually small and glume-like under the upper one, and sometimes under all.

This genus, the largest among Cyperaceæ, is abundant in the temperate and cooler regions of both hemispheres and in mountainous districts within the tropics, with a few species even in the hotter regions. As a genus it is technically separated from *Uncinia* by the absence of the hook to the bristle of the female flower, although in a few species not Australian it occasionally grows out into a flower-bearing peduncle. The genus is widely separated from all others by the utricle as well as by habit. The species are however very difficult to classify and define. Dr. Boott's admirable illustrations as well as his specimens and careful descriptions have given the greatest facilities for their identification, but he had unfortunately not yet published his views as to their general arrangement.

Spikelet solitary, terminal, androgynous.
  Spikelet ovate, many-flowered. Style-branches 2 . . 1. *C. cephalotes.*
  Spikelet small, 2- to 4-flowered. Style-branches 3.
    Outer bract elongated subulate . . . . 2. *C. acicularis.*

Spikelet many-flowered. Upper half male, slender; lower half nearly globular, female, with spreading utricles. Style-branches 3 . . . . 3. *C. capillacea.*

Spikelets usually few, androgynous, in a short terminal spike. Style-branches 2.

Spikelets 3 to 5, male at the base or sometimes wholly female.

Spikelets ovate, green or pale coloured.

Outer bract much longer than the inflorescence . 4. *C. inversa.*

Outer bracts very short.

Utricle scarcely beaked. . . . . 5. *C. canescens.*

Utricle with a long spreading or recurved beak . 6. *C. echinata.*

Spikelets oblong. Glumes dark purple . . . . . 7. *C. hypandra.*

Spikelets 6 to 12, male at the top, the spike sometimes compound at the base . . . . 8. *C. chlorantha.*

Spikelets numerous, androgynous, in a long narrow panicle.

Panicle very narrow and spikelike, the partial spikelike branches short and erect. Style-branches 2.

Stem 3-angled. Utricle ciliate on the angles, with a very short beak . . . . 9. *C. paniculata.*

Stem 3-angled. Utricle not ciliate, with a long beak . . . . 10. *C. declinata.*

Stem terete or nearly so . . . . 11. *C. tereticaulis.*

Panicle narrow but loose, the short branches spreading. Style-branches 3 . . . . 12. *C. fissilis.*

Panicle loose. Spikelets not so numerous as in the preceding species and ½ to ¾ in. long. Style-branches 2 . . . . 13. *C. gracilis.*

Spikelets 3 to 6 or rarely more, the terminal one male, the lower ones female or shortly male at the top and distant. Style-branches 2.

Spikelets all sessile or the lowest scarcely pedunculate.

Glumes mostly obtuse. Spikelets under 2 in.

Spikelets pale-coloured. Utricle abruptly contracted into a short truncate beak . . . . 14. *C. contracta*

Spikelets dark coloured. Utricle not beaked or tapering into a short beak . . . . 15. *C. vulgaris.*

Glumes acute. Spikelets mostly above 2 in. . . . 16. *C. acuta.*

Spikelets all pedunculate, narrow, dark brown . . . 17. *C. lobolepis.*

Spikelets 3 to 6 or rarely more, the terminal one male or female at the top, the lower ones chiefly female and sessile or the lowest shortly pedunculate. Style-branches 3.

Terminal spikelet male, short and slender. Female ones ovoid-globular. Utricles with long spreading beaks . . . . 18. *C. flava.*

Terminal spikelet female at the top. Female ones oblong or cylindrical, not very distant. . . . . 19. *C. Buxbaumii.*

Terminal spikelet male, cylindrical. Female ones oblong or cylindrical, distant.

Stems 3 to 8 in. Leaves usually longer, tufted. Female spikelets mostly with a few males at the base.

Utricles corky, ovoid, with short beaks, 3 lines long . . . . 20. *C. pumila.*

Utricles not corky, ovoid, with short beaks, 1½ lines long. Eastern species . . . . 21. *C. breviculmis.*

Utricles not corky, ovoid, distinctly beaked, 1 to 1½ lines long. Western species . . . . . . 22. *C. Preissii.*

Stems mostly 1 ft. or more. Leaves rarely longer.
Female spikelets usually without males.
Utricles with long beaks, obscurely nerved . . . 23. *C. Gunniana.*
Utricles scarcely beaked, very prominently nerved 26. *C. Brownii.*
Terminal male spikes several, clustered, rich brown.
Stems 1 to 2 ft. . . . . 24. *C. Bichenoviana.*
Spikelets several, cylindrical, the terminal male, the lower ones female or chiefly so and mostly pedunculate. Style-branches 3. Stems tall.
Utricle ovoid, usually dark-coloured, scarcely beaked, very prominently many-nerved.
Glumes ovate or oblong, obtuse . . . . 25. *C. maculata.*
Glumes narrow, acute or with long points . . . . 26. *C. Brownii.*
Utricle tapering into a distinct beak. Peduncles usually long.
Spikelets erect, solitary, long and loose. Glumes narrow, acute or aristate . . . . 27. *C. alsophila.*
Spikelets erect or scarcely spreading, usually 2 or more from the same sheath. Glumes rather broad, acuminate or aristate . . . . 28. *C. longifolia.*
Spikelets spreading or pendulous. Glumes and utricles tapering into long points . . . . . 29. *C. pseudocyperus.*

1. **C. cephalotes,** *F. Muell. in Trans. Phil. Soc. Vict.* i. 110 *and in Hook. Kew Journ.* viii. 335.—Stems slender, usually 2 to 4 in. high. Leaves mostly shorter, very narrow. Spikelets androgynous, solitary, erect, compact, at first ovoid, oblong when fully out, 3 to 4 lines long. Male flowers few at the apex, their glumes scarcely projecting beyond the females. Female glumes ovate, obtuse, scarcely above 1 line long, brown with a prominent midrib and hyaline margins. Utricle rather longer, ovate, much flattened, contracted at the base but scarcely stipitate. Style-branches 2. Nut much flattened, rather shorter than the utricle, very shortly stipulate.—Boott, Ill. Car. iv. 148, t. 477.

Victoria. Munyang Mountains and Mount Kosciusko, at an elevation of 6000 to 7000 ft. *F. Mueller*

Very closely allied to the northern *C. pyrenaica*, which is also in New Zealand but not in Australia, the *C. cephalotes* differs in the shape of the spikelet and glumes and the constantly 2-branched style. I cannot identify it with the *C. capitata*, Linn. as proposed by F. Mueller, Fragm. viii. 251.

2. **C. acicularis,** *Boott in Hook. Fl. Nov. Zel.* i. 280, *t.* 63; *Ill. Car.* iv. 157, *t.* 508, *f.* 2.—Stems 3 to 4 in. high, slender, branching at the base. Leaves usually shorter, subulate or filiform. Spikelet solitary, 2 to 3 lines long, consisting of 2 to 4 female flowers and about as many or only 1 male. Glumes lanceolate, acute or the upper ones obtuse, brown with a greenish keel, the lowest one and sometimes the next also produced into a subulate erect leafy lamina. Utricle narrow, shortly stipitate, produced into a rather long beak, exceeding the glume and slightly 2-fid. Style-branches 3. Nut 3-angled.—*C. Archeri*, Boott in Hook. f. Fl. Tasm. ii. 98, t. 150, Ill. Car. iv. 156, t. 508, f. 3; *C. pyrenaica*, F. Muell. Fragm. viii. 251, not of Wahlenb.

Victoria. Summit of Mount Hotham, at an elevation of 7000 ft. *F. Mueller.*
Tasmania. Cumming's Head, *Archer.*

The Victorian specimens, with 3 or 4 male flowers as well as females, resemble the New Zealand ones. Archer's Tasmanian ones are more slender, with the spikelets reduced to 1 or 2 males and 2 or 3 females, but appear to represent a depauperated state of the same plant. The erect subulate bract, besides the size of the spikelet and other minor characters, readily distinguish it from *C. pyrenaica*.

3. **C. capillacea,** *Boott, Ill. Car.* i. 44, *t.* 110.—Stems filiform, 6 in. to 1 ft. high. Leaves shorter or a few nearly as long, filiform. Spikelet solitary, 3 to 4 lines long, the upper half male and very narrow, the lower half female, much broader and almost globular, the flowers all close together. Glumes ovate, scarcely 1 line long, obtuse or the lowest with a very short point, the females very broad with scarious margins, the males narrower. Utricle sessile, spreading, ovoid, more or less triquetrous, tapering into a very short entire beak, slightly several-nerved. Style-branches 3. Nut 3-angled, shorter than the utricle.—Bœckel. in Linnæa, xxxix. 37: *C. simplicissima*, F. Muell. Fragm. ix. 191.

N. S. Wales. Clarence River, *Wilcox.*

Also in the eastern Himalayas, Sikkim and Bootan.

4. **C. inversa,** *R. Br. Prod.* 242.—Stems in the typical form from a few inches to above 1 ft. high. Leaves shorter, narrow. Spikelets 3 to 5, all sessile in a terminal cluster or short spike, rarely reduced to a single one, or with an additional axillary one rather lower down, all usually androgynous, ovate, 3 to 6 lines long. Outer leaflike bracts 1 to 3, longer than the inflorescence. Glumes very thin and almost hyaline, with a green 1- or 3-nerved keel. Male flowers at the base of the spikelet sometimes numerous occupying half the spikelet, more frequently few only and sometimes quite deficient, rarely 1 or 2 males at the end of the spikelet. Female flowers usually rather numerous. Utricle much flattened, 1½ to 2 lines long including the beak, ovate or obovate, several-nerved, with green ciliate edges, tapering into a bifid beak short in the typical form, nearly as long as the utricle in the larger variety. Style-branches 2. Nut much flattened, nearly sessile. —Boott, Ill. Car. iv. 151, t. 486 to 488; Hook. f. Fl. Tasm. ii. 99; Bœckel. in Linnæa, xxxix. 69; F. Muell. Fragm. viii. 252.

Queensland. Brisbane and Dawson Rivers, *F. Mueller*; Rockhampton, *O'Shanesy;* Rockingham Bay, *Dallachy.*

N. S. Wales. Port Jackson, *R. Brown*, *Sieber*, *n.* 543, *Woolls*; New England, *C. Stuart;* Hastings and Macleay Rivers, *C. Moore;* Head of the Gwydir, *Leichhardt.*

Victoria. Wendu Vale, *Robertson*; Yarra, Mitta Mitta and Hume Rivers, Mount Buller, Darebin Creek, *F. Mueller;* Creswick, *Whan;* Ballarat, *Bacchus.*

Tasmania. South Esk River, *Gunn.*

S. Australia. Mount Barker, *F. Mueller.*

W. Australia, *Drummond, n.* 922.

Var. *major.* Stems 1½ to 2½ ft. high. Utricles 2 lines long, prominently nerved, with a long beak.—Brisbane River, *F. Mueller;* Clarence River, *Wilcox.*

The species is also in New Zealand.

5 **C. canescens,** *Linn.; Boott, Ill. Car.* iv. 154, *t.* 496.—Stems 4 to 9 in. high. Leaves often as long, usually broader and thinner than in *C. inversa.* Spikelets 3 to 8, sessile, either distant or crowded in a terminal spike, androgynous, ovate, 2 to 3 lines long. Subtending bracts small with very short points, or rarely the lowest with a subulate point longer than the spikelet. Glumes usually very thin and often hyaline, obtuse or with a short point. Male flowers few at the base of the spikelet and often a male and a female within the same glume, each with its own small secondary glume. Females rather numerous. Utricle about 1 line long, ovate, compressed, contracted into a very short beak. Bristle within the utricle sometimes long and rigid or dilated and glume-like, but often small or obsolete. Style-branches 2. Nut flattened.—Bœckel. in Linnæa, xxxix. 122; F. Muell. Fragm. viii. 255.

Victoria. Mount Baw-Baw and Munyang Mountains, *F. Mueller.*

Also in the northern and Alpine Europe, Asia and America, and in extra-tropical South America.

6. **C. echinata,** *Murr.; Bœckel. in Linnæa,* xxxix. 124.—Stems tufted, rarely above 6 to 8 in. high. Leaves as long or longer in Australian specimens, shorter in northern ones. Spikelets 3 or 4, rarely 5, either close together in a terminal spike or more frequently at some distance from each other, all sessile, androgynous, 2 to 3 lines long, at first oval-oblong, but ovoid-globular when the fruits have spread. Subtending bracts glume-like with short awns or points. Glumes ovate, acute, hyaline. Male flowers very few at the base of the spikelets or sometimes none. Females several. Utricle longer than the glume, very spreading, ovate or ovate-lanceolate, more or less flattened, with acute angles or narrow wings, and a long straight slender beak. Style-branches 2.—F. Muell. Fragm. viii. 252; *C. stellulata,* Gooden.; Kunth, Enum. ii. 399; Reichb. Ic. Fl. Germ. t. 214.

Victoria. Munyang Mountains, *F. Mueller.*

Extends over the temperate and cooler regions of the northern hemisphere.

7. **C. hypandra,** *F. Muell. Fragm.* viii. 259.—Stems in the specimens seen about 4 in. high. Leaves as long or rather longer, about 1 line broad. Spikelets 4, sessile in a terminal spike, the lowest scarcely pedunculate, the terminal one at least androgynous, oblong, 5 to 6 lines long. Lowest bract leaflike in one specimen, very short in the other. Glumes almost black, scarcely 1 line long, ovate, obtuse. Male flowers several at the base of the terminal spike, few or none at the base of the others. Utricle very flat, ovate, rather acute but not beaked, longer than the glume and contrasted with it by its pale colour but quite glabrous. Style-branches 2.

Victoria. Munyang Mountains, at an elevation of 6000 to 7000 ft., *F. Mueller.*

Of this I have only seen two specimens. It is certainly as observed by F. Mueller, very near the northern *C. bicolor,* All., but that species has the lower spikelets distinctly pedunculate and shorter, broader, more obtuse and evidently canescent utricles.

8. **C. chlorantha,** *R. Br. Prod.* 242.—Stems usually under 6 in. but sometimes above 1 ft. high. Leaves much shorter. Spikelets 6 to 12, sessile in a dense terminal spike of ½ to 1 in. or rarely rather longer and interrupted at the base, and then slightly compound with more numerous spikelets, the spikelets all or mostly androgynous, ovoid-oblong, 2 to 3 lines long, usually brown. Outer bracts glume-like or rarely the lowest with a subulate lamina nearly as long as the inflorescence. Glumes ovate, 1 to 1¼ lines long, acute or mucronate, the keel usually green. Male flowers few at the top of the spikelet. Utricle as long as the glume, much flattened, the edges ciliate, tapering into a short 2-toothed beak. Style-branches 2. Nut flat.—Hook. f. Fl. Tasm. ii. 99, t. 150; Boott, Ill. Car. iv. 171, t. 580, B; F. Muell. Fragm. viii. 256.

N. S. Wales. Port Jackson, *R. Brown.*

Victoria. Ballan, Latrobe and Snowy Rivers, *F. Mueller*; Ballarat, *Bacchus.*

Tasmania. Northern parts of the island, *Gunn*, *Archer* and others; Mount Wellington, *F. Mueller.*

Var. *composita.* Spike slightly compound at the base, approaching the smaller varieties of *C. paniculata.*—Huon River, *Gulliver.*

9. **C. paniculata,** *Linn.; Kunth, Enum.* ii. 389.—Stems attaining several feet, 3-angled and often very acutely so, or when old more striate with the angles less prominent. Leaves varying from 1 to 4 lines broad, the margins very scabrous. Spikelets androgynous, very numerous in a narrow spike-like panicle, usually 3 to 6 in. long, but sometimes much longer and interrupted at the base, with short erect branches or sessile partial spikes, or occasionally almost reduced to that of the compound variety of *C. chlorantha.* Bract at the base of the panicle small and subulate or obsolete. Spikelets varying from ovoid and scarcely 2 lines to lanceolate and 3 lines long, usually brown, Male flowers sometimes numerous occupying at least the upper half, sometimes few only. Glumes ovate, with short points. Utricle much flattened, ovate, many-nerved, the margins more or less ciliate or denticulate, contracted into a short 2-toothed beak. Style-branches 2. —Reichb. Ic. Fl. Germ. t. 223; *C. appressa*, R. Br. Prod. 242; Sieb. Agrostoth. n. 15; Nees in Pl. Preiss. ii. 94; Hook. f. Fl. Tasm. ii. 99; Boott, Ill. Car. i. 46, t. 119, 120; Bœckel. in Linnæa, xxxix. 99; *C. virgata*, Soland.; Boott, l. c. t. 121, 122, Bœckel. l. c. 98; *C. halmaturina*, Bœckel. l. c. 100, partly.

Queensland. Rockhampton, *O'Shanesy* and others.

N. S. Wales. Port Jackson, *R. Brown*, and many others; New England, *C. Stuart*, *Leichhardt*; Hastings River, *C. Moore*; Clarence River, *Wilcox.*

Victoria. From the South Australian frontier to Gipps' Land, *F. Mueller*, *Robertson* and others.

Tasmania. Port Dalrymple and Kent's Group, *R. Brown*; abundant in open forest land, etc., *J. D. Hooker* and others.

W. Australia, *Drummond*, *n.* 216, 272; Capel River, *Oldfield.*

Var. *subdiaphana.* Leaves very long and glumes pale as in *C. declinata*, but the utricles broad and ciliate as in *C. paniculata.*—Queensland, *Hartman*; Rockhampton *Thozet.*

I have followed the example of F. Mueller, Veg. Chath. Isl. 57, in uniting the common Australian and New Zealand *C. appressa* with the *C. paniculata* of the northern hemisphere, as indeed was already suggested by R. Brown in his herbarium, by the note *C. paniculata* being on all his labels.

10. **C. declinata,** *Boott, Ill. Car.* iv. 171, t. 580.—Very closely allied to *C. paniculata*, with the same triquetrous stems, scabrous foliage, inflorescence and short androgynous spikelets male at the top, but the glumes are more membranous, almost white, and the utricle narrower, much less flattened, tapering into a long beak, neither ciliate nor denticulate. Leaves often longer than the stem.—F. Muell. Fragm. viii. 257.

Queensland. Brisbane River, *F. Mueller*, *Bailey*.

N. S. Wales. Blue Mountains, *Mrs. Calvert;* Mount Royal and Narrum-Narrum, *Leichhardt*.

11. **C. tereticaulis,** *F. Muell. Fragm.* viii. 256.—This also is very closely allied to *C. paniculata*, and ought perhaps to be included amongst its varieties. It differs in the stems terete or nearly so, and never so prominently 3-angled, the leaves very narrow and the inflorescence often longer. Spikelets and utricles precisely as in *C. paniculata*.

Victoria. Axe and Hopkins Rivers and Mount Disappointment, *F. Mueller;* Portland, *Walter;* Ararat, *Green;* Mount William, *Sullivan*.

Tasmania. Perth, *C. Stuart*.

S. Australia. Ranges around St. Vincent's Gulf, *F. Mueller*, *Blandowski*, and others; Port Lincoln, *J. S. Browne*.

W. Australia, *Drummond*, *n.* 923; *Preiss*, *n.* 1866; Tweed River, *Oldfield*.

C. halmaturina, Bœckel. in Linnæa, xxxix. 100, is founded chiefly on specimens referred by F. Mueller to *C. tereticaulis*, although, from his describing the stems as 3-angled, he probably would include also the varieties of *C. paniculata* with long panicles.

12. **C. fissilis,** *Boott, Ill. Car.* ii. 86. t. 245.—Stems 2 ft. high or more. Leaves long, 3 to 4 lines broad. Bracts at the base of the lower branches of the panicle leaflike. Panicle narrow, loose and compound, 6 to 8 in. long, consisting of 1 terminal and 3 or 4 distant partial panicles, often 2 together from the axil of the same leafy bract, all narrow pyramidal, the rhachis ciliate on the angles. Spikelets numerous, sessile along the smaller branches but not crowded, 3 to 5 lines long, androgynous, with rather numerous male flowers at the top and usually 3 or 4 females at the base. Glumes membranous, ovate or lanceolate, more or less aristate, the males narrower, and 1 or 2 empty glumes at the base of the spikelet. Utricle narrow, curved, prominently striate, 1¼ to 1½ lines long including the long acuminate beak. Style-branches 3.—*C. indica*, F. Muell., but scarcely of Linn.

Queensland, *Eaves;* Rockingham Bay, *Dallachy*. The species is also in Aneiteum (New Caledonia) whence were the specimens described and figured by Boott. The Queensland ones agree with them, except that the spikelets are rather smaller. The species is certainly very near *C. indica*, Linn., and *C. benghalensis*, Roxb., but does not precisely match with any of our specimens or of Boott's figures, differing from all in the shape of the utricle.

C. Dietrichiæ, Boeckel. in Flora, 1875, 122, from Port Mackay, *Amalia Dietrich*, is from the character given, probably the same species.

13. **C. gracilis,** *R. Br. Prod.* 242.—Stems slender, 1 to 2 ft. high. Leaves long and narrow. Spikelets rather numerous but narrow and ½ to ¾ in. long, erect or scarcely spreading in a narrow simple panicle, mostly androgynous, male at the top, shortly pedunculate and clustered 2 or 3 together, the floral bracts short and subulate, or the lowest much lower down and leaflike with 2 longer peduncles in its axil, one of them bearing 2 or 3 spikelets. Glumes lanceolate or ovate-lanceolate, acute acuminate or shortly aristate. Utricle almost sessile, flattened, ovate, very prominently many-nerved, pubescent, with a long beak.—Boott, Ill. Car. i. 59, t. 154, 155; F. Muell. Fragm. viii. 250.

Queensland. Brisbane River, *Bailey*.
N. S. Wales. Grose River, *R. Brown* (a particularly slender narrow-leaved form); New England, *C. Stuart;* Macleay River, *Beckler;* Lord Howe's Island, *C. Moore*, *Fullagar*.

14. **C. contracta,** *F. Muell. Fragm.* viii. 258.—Stems rather slender, 1 to 2 ft. long. Leaves long and narrow, the floral leaves or bracts short and subulate or the lowest long and leaflike. Spikelets 3 to 6, all rather distant, erect and sessile, or the lowest shortly pedunculate, the terminal one male, slender, 1 to 2 in. long, the others usually shorter, female or rarely with a few male flowers at the top. Glumes narrow, obtuse or almost acute, thin and brown or hyaline, with a green centre or midrib. Utricle much flattened, with nerve-like margins, ovate or elliptical, about 1½ lines long, shortly stipitate and contracted into a very short truncate or scarcely 2-toothed beak, with 3 or 4 prominent nerves on each face. Style-branches 2. Nut flat, nearly orbicular, much shorter than the utricle.

N. S. Wales. Tenterfield and Timbarra, New England, *C. Stuart*.

Scarcely distinct from the New Zealand *C. Raoulii*, Boott, Ill. Car. iii. 109, t. 333, and very near some forms of *C. vulgaris*.

15. **C. vulgaris,** *Fries*, *var.* Gaudichaudiana, *Boott*, *Ill. Car.* iv. 169, *t.* 567.—Stems tufted or emitting creeping stolones, from a few inches to 2 or 3 ft. high. Leaves often longer than the stem and usually narrow, the outer sheaths usually without blades and sometimes split up into filaments. Spikelets 3 to 5, rarely more or fewer, all sessile or the lowest scarcely pedunculate and erect, varying from ½ to 1½ in. long, near together or more frequently rather distant, the terminal one and sometimes a second smaller one immediately under it male, the others female or sometimes with a few male flowers at the top. Glumes dark brown or black, obtuse or very shortly mucronate, often with a green midrib. Utricle very flat, from orbicular to ovate, usually longer than the glume, more or less distinctly several-nerved, obtuse acute or tapering into a short beak. Style-branches 2.—F. Muell. Fragm. viii.

257; *C. Gaudichaudiana*, Kunth, Enum. ii. 417; Hook. f. Fl. Tasm. ii. 99, t. 151 A; *C. cæspitosa*, R. Br. Prod. 242, and of most early authors.

Queensland. Brisbane River, *Bailey.*

N. S. Wales. Port Jackson, *R. Brown;* Liverpool Plains, *A. Cunningham;* New England, *C. Stuart;* Macleay River, *C. Moore.*

Victoria. Numerous localities both in low lands and in the mountains, *F. Mueller* and others; Glenelg River, *Robertson;* Mount William, *Sullivan.*

Tasmania. Port Dalrymple, *R. Brown;* abundant both in low lands and the mountains, *J. D. Hooker.*

S. Australia. From St. Vincent's Gulf to the Murray River, *F. Mueller* and others.

The species is abundant and widely spread over the temperate regions of the northern hemisphere. Its numerous varieties have been detailed at considerable length by Boott, l.c. The Australian form which is also in New Zealand, though correctly reduced by Boott to the comprehensive *C. vulgaris*, Fries, appears to me nevertheless to be quite as distinct from some of its northern forms as they are from the special Scandinavian form to which Fries would limit the *C. cæspitosa*, Linn., and after much examination and comparison I cannot refrain from the conclusion I had formerly come to that the whole, after Goodenough and R. Brown and other older authors, ought to be reunited under the Linnean name of *C. cæspitosa.*

16. **C. acuta,** *Linn.; Kunth, Enum.* ii. 412.—A tall species, very closely allied to the larger varieties of *C. vulgaris*, the spikelets usually longer and more numerous and the glumes narrow and acute or short and aristate. Stems attaining several feet. Leaves longer and rather broad, the lower floral ones or leafy bracts often longer than the inflorescence. Spikelets narrow, 1½ to 4 in. long, 1 to 4 upper ones male and near together, 3 to 5 lower ones more distant and female or the upper ones with a few male flowers at the top, all erect and sessile or the lower ones shortly pedunculate. Glumes oblong-lanceolate or linear or short and tapering to a fine point, dark with a light-coloured midrib unless when very narrow, the females more acute or aristate than the males. Utricle very flat, varying as in *C. vulgaris* from ovate and obtuse to ovate-elliptical and very-shortly beaked, more or less distinctly several-nerved.—Boott, Ill. Car. iv. 165, t. 548 to 556; F. Muell. Fragm. viii. 259; *C. Cunninghamii*, Boott, Ill. Car. iv. 171, t. 579; *C. polyantha*, F. Muell. in Trans. Phil. Soc. Vict. i. 110, and in Hook. Kew Journ. viii. 334.

Queensland. Moreton Bay, *Leichhardt.*

N. S. Wales. Banks of Tuon River, *A. Cunningham;* New England, *C. Stuart;* Clarence River, *Wilcox.*

Victoria. Valleys near Mount Hotham, *F. Mueller.*

The species is spread over Europe, Northern Asia and North America. The Australian form has rather longer and more numerous spikelets than usual in the northern ones, but I can find no other difference, and some European specimens appear to be quite similar.

17. **C. lobolepis,** *F. Muell. Fragm.* viii. 258.—Stems 1 to 2 ft. high, slender but rigid. Leaves sometimes as long, the sheaths bordered by a scarious membrane at length torn into shreds. Lower floral leaves or bracts longer than the inflorescence, with very short

sheaths. Spikelets 4 to 6, cylindrical, narrow, 1½ to nearly 2 in. long, the terminal one male or with a few female flowers at the top, the others female or with a few males at the top or at the base, all pedunculate, at first erect, but spreading or pendulous when in fruit. Glumes a rich brown, obtuse emarginate or shortly 2-lobed, the prominent midrib often produced into a short point. Utricle sessile, ovate, flat, rather acute but not beaked, faintly several-nerved. Style-branches 2.

N. S. Wales. New England, *C. Stuart*, *C. Moore*.

Not matched with any extra-Australian species, though apparently in some measure allied to the North American *C. crinita*.

18. **C. flava,** *Linn.; Kunth, Enum.* ii. 446.—Stems under 6 in. in the Australian specimens, often longer in northern ones, but rarely attaining 1 ft. Leaves as long or longer in the small varieties. Spikelets 3 to 5, the terminal one male, narrow, 3 to 5 lines long, all the others female, sessile, ovoid or globular, crowded under the male spikelet or the lower ones more or less distant. Glumes oblong, obtuse, thinly membranous, pale coloured and often hyaline on the margins. Utricles longer than the glume, very spreading or reflexed, ovoid, rather turgid, tapering into a rather long beak, prominently several-nerved. Style-branches 3.—Reichb. Ic. Fl. Germ. t. 273; *C. cataractæ*, R. Br. Prod. 242; Hook. f. Fl. Tasm. ii. 101, t. 151; Boott, Ill. Car. iv. 204.

Tasmania. Port Dalrymple, *R. Brown*; Alpine marshes, *Gunn*, *Archer*; Swanport, *Story*.

Boott has already expressed his opinion that the Tasmanian plant is scarcely to be distinguished from the *C. flava*, widely distributed over the temperate regions of the northern hemisphere, and although in some specimens the beak of the utricle is rather shorter, others appear to be quite similar to such of the northern forms as have the spikelets approximate. Story's specimens have smaller utricles like those of the northern var. *Rœderi*.

19. **C. Buxbaumii,** *Wahlenb.; Kunth, Enum.* ii. 432.—Stems often tufted but emitting creeping stolones, 1 to 2 ft. high. Leaves rather long, but usually shorter than the stem. Spikelets 3 or 4, in a terminal spike but not very close, oblong or cylindrical, 3 to 9 lines long, all erect and sessile or the lowest very shortly pedunculate, the terminal one androgynous, the male flowers at the base few only or occupying nearly the whole spikelet, the lower ones female. Outer leafy bract often as long as the inflorescence. Glumes 2 to nearly 3 lines long, ovate-lanceolate, the keel produced into a fine rigid point. Utricle ovate-elliptical, compressed or 3-angled but with obtuse edges, about 1½ lines long, not beaked, the orifice entire or minutely 2-toothed. Style-branches 3.—Boott, Ill. Car. iv. 136, t. 438, 439; Bœckel. in Linnæa, xl. 396; F. Muell. Fragm. viii. 252.

Victoria. Alpine boggy pastures between Mount Hotham and the Cabonga River and between Lake Omeo and Snowy River, *F. Mueller*.

Extends over Europe, Northern Asia and North America; the Australian specimens have generally longer and longer-pointed glumes than the northern ones, but closely resemble a few of Hoppe's from South Germany.

20. **C. pumila,** *Thunb.; Boott, Ill. Car.* iv. 217.—Rhizome often creeping in the sands to a great extent. Stems 4 to 8 in. high. Leaves much longer, more rigid than in *C. breviculmis,* tapering into long subulate points. Spikelets 3 to 6, the terminal one male, narrow, ¾ to rather above 1 in. long with often 1 or 2 smaller male ones immediately below it, the lower ones female or with a few male flowers at the top, distant, sessile or the lowest shortly pedunculate, ½ to ¾ in. long. Lower outer bracts leaflike and sometimes very long, the upper ones subulate or small. Glumes at the time of flowering ovate-oblong or lanceolate, usually purple, with scarious or hyaline margins, the keel prominent and more or less produced into a point, often enlarged under the fruit brown and acuminate. Utricle larger than in the allied species and of a thick corky substance, ovoid, nearly 3 lines long, shortly contracted at the base, faintly nerved, tapering into a short bifid beak. Style-branches 3.—F. Muell. Fragm. viii. 251; *C. littorea,* Labill. Pl. Nov. Holl. ii. 69, t. 219; R. Br. Prod. 243; Hook. f. Fl. Tasm. ii. 100.

Queensland. Moreton Island, *M'Gillivray, F. Mueller.*

N. S. Wales. Hastings River, *Beckler;* Clarence River, *Beckler, Wilcox.*

Victoria. Sandy sea-shores and also grassy river banks; inland in numerous localities along the principal rivers, *F. Mueller;* Portland and Wendu River, *Robertson;* Glenelg River, *Allitt;* Wimmera, *Dallachy.*

Tasmania. Port Dalrymple, *R. Brown;* sandy shores, common, *J. D. Hooker* and others.

S. Australia. Crystal brook, Torrens and Gawler Rivers, *F. Mueller.*

Also in New Zealand, along the eastern coasts of Asia and in extratropical South America.

21. **C. breviculmis,** *R. Br. Prod.* 242.—Stems usually only a few inches high but in northern specimens 1 ft. or more. Leaves in most of the Australian specimens longer than the stem, the lower floral bracts often very long and narrow, the upper ones or very rarely all short and subulate. Spikelets 2 to 5, narrow-cylindrical, mostly about ½ in. long and rather loose, the terminal one male, the lower ones female or 1 or more of them with male flowers in the upper half, all erect and sessile or the lowest shortly pedunculate, distant or the upper ones crowded together. Glumes loosely imbricate, thinly membranous, the females with a prominent keel produced into a fine point, the males obtuse or shortly mucronate. Utricle shortly stipitate, ovoid, usually longer than the glume but shorter than its point, very faintly or more distinctly many-nerved, glabrous or minutely pubescent, with a rather long conical beak. Style-branches 3.—Boott, Ill. Car. iv. 181; Hook. f. Fl. Tasm. ii. 101, Fl. Nov. Zel. t. 63; F. Muell. Fragm. viii. 255; *C. Royleana,* Boott, Ill. Car. i. 6, t. 19.

N. S. Wales. Port Jackson, *R. Brown* (small dwarf specimens), *Woolls;* Newcastle, *Leichhardt;* Lord Howe's Island, top of Mount Lingbird, *C. Moore;* high on Mount Gower, *Fullagar.*

Victoria. Wendu Vale, *Robertson;* Yarra River, Darebin Creek and Munyang Mountains, *F. Mueller.*

Tasmania, *Gunn;* Cheshunt, *Archer.*

Also in New Zealand, the Himalayas and Japan.

22. **C. Preissii,** *Nees in Pl. Preiss.* ii. 94.—Scarcely distinct from *C. breviculmis.* Stems tufted, under 1 ft. high, slender. Leaves often longer, narrow, the lower floral ones or outer bracts similar, the upper ones smaller or glume-like. Spikelets 3 to 6, cylindrical, the terminal one male, ½ to ¾ in. long and often close to it 1 or 2 small androgynous ones, the others distant, either androgynous with a few male flowers at the top or entirely female, all erect and sessile or on very short peduncles. Male glumes oblong, obtuse or mucronate, with scarious margins and a 1- or 3-nerved centre, the female glumes shorter, broader and more acute. Utricles rather narrow, 3-angled, contracted at the base, tapering into a short beak, the angles often serrulate-ciliate, the sides rather faintly nerved. Style-branches 3.—Boott, Ill. Car. i. 68, t. 186; F. Muell. Fragm. viii. 251; *C. thecata,* Boott in Trans. Linn. Soc. xx. 143.

W. Australia. Swan River, *Drummond 1st coll. and n.* 921, *Preiss, n.* 1861, *Oldfield;* Rottonest Island, *Preiss, n.* 1825; Vasse River, *Pries.*

23. **C. Gunniana,** *Boott in Trans. Linn. Soc.* xx. 143, *Ill. Car.* i. 68, *t.* 185.—Stems 6 in. to 2 ft. high. Leaves often as long, narrow or rather broad, the lower floral ones or outer bracts similar, the upper smaller, but all except the last longer than the inflorescence. Spikelets 3 to 6, cylindrical, the terminal one male, ¾ to 1½ in. long, and sometimes 1 or 2 small male ones close under it, the others female and distant or the uppermost close to the males, all erect sessile or shortly pedunculate and as long as the terminal one. Male glumes oblong or almost ovate, obtuse or acute, with scarious margins, the prominent keel usually produced into a point; female glumes shorter, broader, with a longer point. Utricle obtusely 3-angled, rather turgid, rounded at the base, tapering into a rather long acute 2-toothed or 2-cleft beak, the nerves scarcely prominent. Style-branches 3. Nut broad, shortly stipitate.—Hook. f. Fl. Tasm. ii. 100; F. Muell. Fragm. viii. 251.

N. S. Wales. Darling River, *Beckler.*

Victoria. Dargo, Mitchell and Curdie's Rivers, Maroka Valley, Baw-Baw and Munyang Mountains, ascending to 6000 ft., *F. Mueller.*

Tasmania. *Gunn;* Cheshunt, *Archer.*

S. Australia. Mount Lofty Ranges, *F. Mueller.*

C. barbata, Boott, Ill. Car. i. 68, t. 187, from New Norfolk, *Gunn,* appears to me to be a slight variety of *C. Gunniana,* with darker coloured glumes, but the specimens are in flower only with the utricles not yet full grown. A similar variety with still darker and rather larger glumes was gathered by F. Mueller on the Murray River.

24.? **C. Bichenoviana,** *Boott in Hook. f. Fl. Tasm.* ii. 101.—Stems 1 to 2 ft. high. Leaves often as long or longer, the lowest distant floral ones or outer bracts similar but with very short sheaths, the upper ones small. Spikelets in our specimens 4 to 10 males in a terminal cluster, the central one 1¼ in. long, the outer ones much shorter, and 3 or 4 lower down females or androgynous, ½ to 1 in. long, 1 or 2 not very distant, the lowest far down and in one axil is a secondary cluster of male spikelets, all erect, cylindrical, of a rich brown. Glumes obtuse, but the midrib or keel produced into a point. Utricles too young to characterise. Style branches 3.

Tasmania. Woolnorth, *Gunn.* This is evidently a distinct species, although the specimens are too few and not far enough advanced for a full description.

25.? **C. maculata,** *Boott in Trans. Linn. Soc.* xx. 128; *Ill. Car.* i. 9, *t.* 26.—Stems long and weak. Leaves long, the floral ones or outer bracts exceeding the inflorescence, the sheaths bordered by a broad thinly scarious brown membrane. Spikelets several, 3 or 4 usually sessile in a terminal cluster, of which 1 wholly male and 1 to 3 androgynous the male flowers at the top, and 2 to 4 females more or less distant and pedunculate, the lowest often far down on a long slender peduncle, but all erect, cylindrical, mostly about 1 in. long. Glumes ovate or oblong, obtuse or scarcely mucronate, thinly scarious, pale brown or hyaline. Utricles sessile, ovoid, often compressed, rather acute or very shortly beaked, longer than the glume, very prominently several-nerved. Style-branches 3. Nut 3-angled.—*C. neurochlamys,* F. Muell. Fragm. viii. 258.

Queensland. Brisbane River, Moreton Bay, *F. Mueller, C. Stuart, Bailey;* Rockingham Bay, *Dallachy.*
N. S. Wales. Tweed and Richmond Rivers, *C. Moore.*

Also in East India, as identified by Boott.

26. **C. Brownii,** *Tuckerm. Enum. Car.* 21.—Stems 1 to 2 ft. long, rather weak. Leaves long, the lowest floral ones or outer bracts often exceeding the inflorescence, the upper ones short and subulate. Spikelets usually 3 or 4, very near together at the end of the stem, erect and sessile or nearly so, but sometimes the lowest more distant and more or less pedunculate, the terminal one male, the others female all ½ to ¾ in. long. Glumes more or less scarious, narrow or short and acuminate, the midrib produced into a rather long point. Utricle ovoid, turgid or nearly globular, usually dark-coloured in fruit, rather more than 1 line long, prominently many-nerved, abruptly contracted into a very short 2-toothed beak. Style-branches 3.—Boott, Ill. Car. iv. 161, t. 532, F. Muell. Fragm. viii. 250; *C. striata,* R. Br. Prod. 243, Kunth, Enum. ii. 458, Sieb. Agrostoth. n. 16, not of Michaux.

N. S. Wales. Hunters and Williams Rivers, *R. Brown;* Hastings River, *C. Moore;* Richmond River, *Fawcett;* Archer's Creek, *Leichhardt.*
Victoria. Hume and Curdie's Rivers, *F. Mueller;* Ballarat, *Bacchus.*

C. lacistoma, R. Br. Prod. 243; Boott, Ill. Car. t. 532, appears to have been correctly referred by F. Mueller, to *C. Brownii.*

27. **C. alsophila,** *F. Muell. Fragm.* viii. 257.—A tall plant with

the long rather broad leaves of *C. longifolia*, but the floral ones or outer bracts, though very long, without sheaths or with only very short ones. Spikelets 4 to 6, the terminal one male, narrow, 1 to 1½ in. long and rarely 1 or 2 smaller male ones close under it, the remainder female, more or less distant, varying from 1 to 3 in. long, usually loose, solitary in the axils on short or the lower ones on long peduncles. Glumes narrow, acuminate with long points, or the females rather shorter pointed. Utricles 2 to 3 lines long, shortly stipitate, tapering into a rather long beak, resembling those of *C. longifolia* but rather more turgid and more distinctly nerved. Style-branches 3.

Victoria. Mounts Baw-Baw, Arnott and Julliete; Upper Yarra, Tarwan, Latrobe and Goulburn Rivers, ascending to 4000 ft., *F. Mueller.*

28. **C. longifolia,** *R. Br. Prod.* 242.—Stems 2 to 3 ft. high, with long rather broad leaves, the lower floral ones or outer bracts long and leaflike, with long sheaths. Spikelets 6 to 20, the terminal one male, 1 to 1½ in. long, often accompanied by a cluster of shorter ones all male or partially female, the others all pedunculate and female or with a few male flowers at the base or at the top, 1 to 2 in. long, the peduncles slender and usually clustered 2 to 4 together in the axils of the long leaflike outer bracts or floral leaves, the sheaths of the lower ones long. Glumes scarious, rather broad, acuminate or obtuse and aristate, the keel usually prominent. Utricles oblong-elliptical, stipitate, prominently 3-angled, tapering into an entire or 2-toothed beak, nearly 3 lines long including the beak. Style-branches 3. Nut short, prominently 3-angled.—Boott, Ill. Car. iii. 108, t. 331, 332; Sieb. Agrostoth. n. 14; Hook. f. Fl. Tasm. ii. 101; F. Muell. Fragm. viii. 250; *C. Brownei*, Steud. Syn. Glum. ii. 209.

Queensland. Upper Brisbane River, *F. Mueller;* South Queensland, *Hartmann.*
N. S. Wales. Paterson River, *R. Brown;* Richmond, *Woolls;* Richmond, Macleay and Clarence Rivers, *Beckler;* Hastings River, *C. Moore.*
Victoria. Ballan, Cobberas Mountains, Tambo River, *F. Mueller.*
Tasmania. Derwent and South Esk Rivers, *Gunn;* Swanport, *Story.*

29. **C. pseudocyperus,** *Linn.; Kunth, Enum.* ii. 501.—Stems stout, angular, 2 to 3 ft. high. Leaves long, 2 to 5 lines broad. Spikelets 2 to 5, all pedunculate and at length pendulous, but usually near together at the end of the stem, cylindrical, 1 to 2 in. long, the terminal one male, the others female. Outer bracts long and leaflike. Glumes very shortly ovate or lanceolate, tapering into fine points. Utricles when ripe very spreading or reflexed, ovoid-oblong at the base, strongly nerved and tapering into a long rigidly acuminate 2-cleft beak, the whole utricle including the beak varying from 2 to 3 lines, on a very short stipes, rather longer however in the Australian than in most of the northern specimens.—R. Br. Prod. 243; F. Muell. Fragm. viii. 249; *C. fascicularis*, Soland.; Boott, Ill. Car. i. 53, t. 139; Hook. f. Fl. Tasm. ii. 101.

Queensland. Boyne River, *Hartmann.*
N. S. Wales. Newcastle, *R. Brown;* Paramatta, *Woolls;* north of Bathurst, *A. Cunningham;* New England, *C. Stuart;* Castlereagh River, *C. Moore.*

Victoria. Wannon River, *Robertson;* Portland, *Allit;* Ballarat, *Day;* Mount Baw-Baw, Goulburn Ranges, Hume River, etc., *F. Mueller.*

Tasmania. Port Dalrymple, *R. Brown;* common in marshy situations, *J. D. Hooker.*

S. Australia. Spencer's Gulf, *R. Brown;* Mount Torrens and Lofty Ranges, *F. Mueller.*

W. Australia, *Drummond,* 1*st coll. and n.* 924; Karri Dale, *Walcot.*

Widely spread over the temperate regions of the northern hemisphere. In uniting the Australian with the European species I have followed F. Mueller as I can find no constant character to separate them. He also adds to the synonyms the New Zealand *C. Forsteri*, Wahlenb., which has usually much smaller utricles but might well be regarded as a variety only.

ORDER CXLIV. GRAMINEÆ.

Flowers hermaphrodite or unisexual, in little green or more or less scarious spikes called *spikelets*, consisting of several scale-like distichous bracts called *glumes*, the two or sometimes 1 or rarely 3 or more lower ones and sometimes 1 or more upper ones empty, the other one or more with one sessile flower in the axil of each. No normal perianth, but the flower usually enclosed in a 2-nerved glume-like scale called a *palea* (supposed to represent the 2 bracteoles of Hypolytreæ or the perigynium of Cariceæ), and the perianth probably represented by 2 or rarely 3 small usually very thin and hyaline scales called *lodicules*, the palea or the lodicules or both deficient in a few genera. Stamens usually 3, occasionally reduced to 2 or 1, in a few genera 6 or more; filaments free, filiform; anthers usually exserted from the spikelet, versatile, ovate oblong or linear, with 2 parallel cells opening longitudinally without any prominent connective. Ovary entire, 1-celled, with 1 erect anatropous ovule. Styles 2 or rarely 3, free or united at the base into a 2- or 3-branched style, the upper stigmatic portion or *stigmas* usually long, either feathery with simple or branched stigmatic hairs, or more rarely simple with the stigmatic hairs very short or reduced to scarcely prominent papillæ. Fruit a small seedlike nut or utricle, often enclosed in the palea and subtending glume, the thin membranous pericarp usually closely adnate to the seed and inseparable from it, sometimes adnate also to the enclosing palea, in a few genera free and loosely surrounding the seed. Seed erect, albuminous, with a thin adnate testa. Embryo small, usually globular or nearly so, on one side of the base of the albumen.—Herbs usually tufted or decumbent or creeping and rooting at the base, sometimes tall and branching, or in species not Australian, shrubby or almost arborescent. Stems usually hollow between the nodes. Leaves alternate, entire, parallel-veined, usually long and narrow, sheathing the stem at their base, but the sheaths split open from the base opposite the blade and often ending within the blade in a scarious or ciliate appendage called a *ligula.* Inflorescence terminal, rarely also from the sheaths of the upper leaves,

the spikelets variously arranged in spikes, racemes, panicles or heads. Bracts occasionally but rarely subtending the branches of the panicle or single spikelets.

A very large Order, abundantly diffused over the whole world, in almost every variety of station, and supplying many of the most important articles of food and raiment, or applied to a great variety of economical purposes. Of the 102 genera here enumerated, twelve are included only as containing introduced species reported as more or less perfectly naturalised, 90 have species believed or known to be truly indigenous. Of these, no less than 54 extend over both the New and the Old World, 26 of them chiefly tropical, 28 entirely or chiefly extra-tropical or equally distributed in temperate and warm regions, 18 more extend into Asia, a few of them also into Africa and New Zealand, 3 are common to Australia and New Zealand, one extends only to South Africa, and fourteen genera only, most of them small, are endemic in Australia. The introduced species, of which besides the above mentioned 12 introduced genera, there are at least as many belonging to genera with indigenous species, are chiefly of European origin, a very few South African, and one at least Asiatic and another American.

Gramineæ have been the object of special studies of several of the most eminent botanists, amongst which the labours of Brown, of Kunth, and of Trinius have been the most important. But the only general enumeration they have left is that of Kunth, who had not at that time the materials nor yet the leisure to investigate the synonymy, which had already become exceedingly confused. This confusion has been gradually increasing by the large number of species described in partial works, without that general comparison which is especially needed in an Order in which a large proportion of the species have a very wide geographical distribution, and it has become more especially involved through Steudel's more recent hasty and careless compilation (Synopsis Plantarum Glumacearum). Nothing therefore is now more needed than a careful and judicious synoptical revision of the whole Order. Such a one is now in progress for De Candolle's Monographs by my friend General Munro, who has for a number of years made Gramineæ his special study, as well on living plants in tropical and temperate countries, as on dried specimens from the principal herbaria of the day, and in the correctness of whose views all those who have studied the partial memoirs he has published, feel fully convinced. Without his kind assistance the preparation of this part of my Flora would have been doubly laborious. He has however guided me throughout, and although I am far from holding him responsible for the generic and specific arrangement and characters here given, it is to him that I am indebted for many of them, and the whole have been the subject of discussion between us.

The only point on which there may not yet be perfect coincidence between us, is as to the expediency of retaining the terminology I first attempted in my Handbook of the British Flora, and which, the more I have studied the Order, the more I see reason to persist in, as explained in some detail in a paper printed in the Journal of the Linnean Society, vol. xv. For those who think that Kunth's terminology is still the most convenient, though not the most correct, it may be sufficient to explain, that my *palea* is for them the *upper palea*, my *flowering glume* their *lower palea*, and my *empty glumes* their *glumes* or *neutral flowers*, according as they are theoretically supposed to represent glumes that have never any flower in their axils, or glumes that occasionally in other genera or species enclose an imperfect or perfect flower. I should consider a flower in Gramineæ as perfect (male, female, or hermaphrodite) when it has a palea lodicules and either stamens or pistil or both, rudimentary when reduced to the palea, and no flower at all when even that is absent. This will explain an apparent discrepancy in the same spikelet being described as biflorous (2-flowered) by Kunth, sesquiflorus (1½-flowered) by Trinius, and uniflorous (1-flowered) by myself.

Gramineæ, the third Order among phænogamous plants in respect of numbers of species, and probably the most numerous in individuals, are as uniform in the structure of their organs of reproduction as Compositæ, which stand first as to numbers of species (Leguminosæ, the second, being much more varied in their flowers and fruits). The characters available for their distribution into tribes and genera must be derived therefore chiefly from organs generally regarded as of secondary value, bracts and inflorescence. Hence the great difficulty in assigning definite limits to the groups formed. It has been admitted by most botanists that two great series, the *Panicaceæ* and *Poaceæ*, as indicated by Brown, are generally distinct, although not differing in flowers or seeds so as to be raised to the rank of sub-orders. But there has been some difference of opinion as to the precise characters to be assigned to them. Brown relied chiefly on the position of the fertile flowers apparently (though not theoretically) terminal, and either solitary or with a male or rudimentary flower below it in Panicaceæ, whilst in Poaceæ the rhachis is produced beyond the solitary or uppermost fertile flower, either as a bristle or bearing a male or rudimentary flower above it. But this character, if strictly adhered to, would transfer the Stipaceæ, many Agrostideæ, and some others from Poaceæ to Panicaceæ, and would widely separate species which are almost if not strictly congeners, such as *Agrostis* from *Deyeuxia*, *Phleum* from *Chilochloa*, *Aira* from *Deschampsia*, or even still more closely allied species as in *Cynodon*. Fries has proposed another character, adopted by some modern botanists, for the two groups, which he terms *Clisantheæ* and *Euryantheæ*, the former with the spikelets closed in flower, the stigmas protruding from the top of the flowering glume, the latter with the spikelets open in flower, the stigmas protruding at the sides or base of the flowering glume. But not only is this character practically useless as it can only be observed on the living plant, many grasses only opening for a few hours in the day, and has indeed been verified only on a certain number of species inhabiting temperate regions, but it cannot be constant in tropical grasses, for I have seen dried specimens of *Panicums* for instance with short styles and the stigmas protruding laterally below the middle of the glumes, nor does it prove natural in as far as actually carried out, since for instance it removes *Sesleria* and a few others from Poaceæ to Panicaceæ. Munro, while admitting that both the above characters are general, though not constant, has relied chiefly on a third, which proves to be a much safer practical guide, the articulation of the rhachis of the spikelet below the outer glumes (on the pedicel) in Panicaceæ, above them or rarely none in Poaceæ. From this character I have observed no deviation, except perhaps in a very few Phalarideæ, a tribe distinctly separable on other grounds. It settles also the position of a few genera such as *Polypogon*, *Milium*, *Isachne*, etc., which might at first sight appear closely to connect the two great series.

The arrangement here adopted of the tribes and subtribes is derived generally from the study of Old World especially Australian grasses, and may require some modification when a few American genera, which I have not specially examined, are taken into consideration.

It may be objected by some that I have adopted too many monotypic or small genera, distinguished by characters of no importance, more so than I have done in other instances. But the characters which separate even the larger groups of Gramineæ are necessarily such as would in many Orders be regarded as unessential, and I have been unwilling to reunite on that ground genera distinguished by experienced Agrostologists, where I was unable to give to the combined group a more clearly distinctive character than those which separate the partial ones.

I have not thought necessary to repeat in each generic character the "Stamens 3 or fewer" or the "2 feathery stigmas," so very general in the Order, but have only referred to these organs when anything exceptional has been observed. The peculiarities of the ramifications of the stigmas can rarely be well ascertained from dried specimens, especially among the Poaceæ where they are so very delicate and evanescent, and if the importance attached to them by some recent botanists be real, that can only be proved when those of tropical and trans-tropical grasses shall have been more extensively examined on living plants.

I have seldom mentioned the lodicules, as, with the exception of the apparently constant presence of the third lodicule in Stipaceæ, I have not been able to satisfy myself of the generic, or in most cases even of the specific constancy of the forms described. Lodicules appear to be the abortive relics of organs which have lost all physiological functions, and as such are necessarily variable in size and form though constant in position. When thin they disappear after flowering, and are often very minute, they are therefore very difficult to observe in the dried state, and have indeed been observed in comparatively few species and in very few individuals of each species, and very frequently I have been unable to find the precise forms figured by Kunth and others of whose accuracy there can be no doubt. At any rate they are not yet sufficiently known to form the basis of any practical determination of genera or species.

A. Panicaceæ. (Primary Series rather than Suborder). *Pedicel articulate below the glumes. Spikelet with* 1 *fertile flower, the male or barren flower, if any, below it.*

TRIBE I. **Paniceæ.** *Fertile spikelets with* 1 *terminal hermaphrodite or female flower, with or without a male one below it. Glumes* 4 *or* 3, *the upper flowering one of a firmer texture, the outer one usually smaller, sometimes wanting. A palea to each flower. Stamens* 3, *rarely fewer. Grain enclosed in the hardened (rarely thin but stiffened) upper glume and palea. Awns rare, and when present neither twisted nor bent back.*

SERIES I. *Spikelets hermaphrodite.*

Inflorescence not bracteate. No bristle-like involucre.
  Fruiting glume hardened (except in *Panicum myurus*).
  Glumes 3 (the outer one deficient).
    Spikelets not callous at the base. Flowering glume not awned . . . . 1. PASPALUM.
    Spikelets with a callous annulus or cup at the base. Flowering glume with a point or short awn . 2. ERIOCHLOA.
  Glumes 4.
    Outer glume shorter than the others, often minute, not awned . . . . 3. PANICUM.
    Outer glume with a long awn . . . . 4. OPLISMENUS.
Spikelets surrounded by or intermixed with abortive branches of the panicle, forming a lobed or bristly involucre. Fruiting glume hardened.
  Spikelets intermixed with long persistent bristle-like branches, and falling off from them . . . . 5. SETARIA.
  Involucres crowded or distant along a simple rhachis, each enclosing 1 to 3 spikelets and falling off with them.
    Involucres of 3 or 4 unilaterally divided branches not completely surrounding the spikelet . . 6. PLAGIOSETUM.
    Involucres of numerous simple or plumose bristles completely surrounding the spikelet. . . . 7. PENNISETUM.
    Involucre of several outer bristles and inner flat lobes completely surrounding 1 to 3 spikelets and at length hardened . . . . 8. CENCHRUS.
Branches of the panicle produced beyond the base of the last spikelet. Fruiting glume stiff but scarious and rather thin.
  Spikelets solitary or few along the slender inarticulate branches of the panicle . . . . . 9. CHAMÆRAPHIS.
  Spikelets few on the very short branches of a spike-like panicle, the common rhachis broad and flat, at length articulate . . . . 10. STENOTAPHRUM.
Spikes of few spikelets enclosed at the base in sheathing bracts . . . . 11. XEROCHLOA.

SERIES II. *Spikelets unisexual. Stems prostrate or divaricate.*

Spikelets monœcious in a simple spike, the upper ones male, the lower female . . . . 12. THUAREA.

Spikelets diœcious, in dense heads. . . . . 13. SPINIFEX.

TRIBE II. **Andropogoneæ.** *Fertile spikelets with* 1 *terminal hermaphrodite or female flower, with or without a male one below it. Glumes* 4 *or rarely fewer, one of the outer ones the largest enclosing the fruit, the third smaller thin and hyaline sometimes wanting, the upper or flowering one very thin and hyaline, often bearing a twisted and bent awn. A palea to each flower sometimes very small or deficient in the fertile flower. Stamens* 3, *rarely fewer.*

(The awn when present is terminal or between the notches of the flowering glume in all except *Arthraxon.*)

SUBTRIBE I. **Zoysieæ.** *Spikelets solitary or rarely in clusters of* 2 *or* 3, *inserted all round the inarticulate rhachis of a simple spike or raceme. Awns none on the flowering glume, none or straight on the outer ones.*

Spikelets sessile in notches of the rhachis and closely appressed. Glumes 2, smooth . . . . 14. ZOYSIA.
Spikelets 2, rarely 3 or 4 together on very short pedicels. Glumes usually 3, the larger one echinate, a minute outer one sometimes wanting and a small hyaline flowering one . . . . 15. LAPPAGO.
Spikelets in a dense spike, not awned. Glumes 4, the outer one the largest . . . . 16. NEURACHNE.
Spikelets in a loose spike or raceme, very narrow. Glumes 3, the 2 outer ones with straight awns . . 17. PEROTIS.

SUBTRIBE II. **Rottboellieæ.** *Spikelets awnless, in pairs or rarely solitary, in alternate notches of the articulate rhachis of a simple spike, one sessile fertile and more or less embedded in a cavity of the rhachis, the other pedicellate.*

Spike densely silky-hairy. Outer glume of the sessile spikelet 2-lobed. Pedicellate spikelet barren . . 18. ELIONURUS.
Spike 1-sided, the rhachis scarcely articulate. Pedicellate spikelet barren . . . . 19. HEMARTHRIA.
Spike 1-sided. Outer glume of the sessile spikelet hard and globular. Pedicellate spikelet barren . . . 20. MANISURIS.
Spike nearly cylindrical. No pedicellate spikelet . . 21. OPHIURUS.
Spike nearly cylindrical. Pedicellate spikelet barren or fertile . . . . 22. ROTTBOELLIA.
(See also some species of 25, ISCHÆMUM.)

SUBTRIBE III. **Mayadeæ.** *Spikelets unisexual, the male usually paniculate, the females spicate at the base of the males or in a separate inflorescence.*

Female spikelets below the males, the fruiting glume very hard, smooth and shining . . . . 23. CHIONACHNE.
(The cultivated Maize, *Zea Mays*, belongs to this subtribe.)

SUBTRIBE IV. **Euandropogoneæ.** *Spikelets in pairs or threes rarely solitary, one sessile and fertile and one or two pedicellate and male neuter or rudimentary, rarely fertile or deficient. Flowering glume of the fertile spikelet usually awned or reduced to the awn.*

(The awn is deficient in *Imperata*, in *Ischæmum pectinatum*, and sometimes minute or deficient in some varieties of other species.)

Spikelets in pairs along one side of a simple spike or of the spikelike branches of a simple panicle.
  Spike single. Spikelets unisexual, the awned females turned to one side, the awnless males imbricate behind them . . . . 24. HETEROPOGON.
  Spikes single or digitate. Sessile spikelet with a male flower below the fertile one . . . . . 25. ISCHÆMUM.

Spikes digitate. Spikelets 1-flowered, solitary in the notches . . . . 26. DIMERIA.
Spikes digitate. Spikelets 1-flowered with a barren pedicel in the same notch. Awn dorsal near the apex . . . . 27. ARTHRAXON.
Spikes digitate. Spikelets in pairs, both 1-flowered and usually fertile . . . . 28. POLLINIA.
Spikes solitary digitate or several nearly sessile on a simple rhachis. Sessile spikelet 1-flowered and fertile, pedicellate one male or neuter . . . . 29. ANDROPOGON.
Spikelets in single or few pairs or triplets on the slender branches of a more or less compound panicle.
Panicle long and dense, usually cylindrical, the spikelets awnless, concealed under long silky hairs . . . . 30. IMPERATA.
Panicle loose. Fertile spikelets awned.
Outer glume either membranous or narrow and rigid with 2 prominent often muricate lateral nerves . . . . 31. CHRYSOPOGON.
Outer glume when in fruit hard, smooth and shining, ovate or lanceolate . . . . 32. SORGHUM.
Spikelets in triplets (1 sessile and fertile between 2 pedicellate and male neuter or rudimentary) within sheathing bracts.
Triplets surrounded by an involucre of 4 male or neuter spikelets at the base of the peduncle . . 33. ANTHISTIRIA.
Triplets sessile or pedunculate within the bract without any involucre . . . . 34. APLUDA.

SUBTRIBE V. **Tristegineæ.** *Spikelets paniculate, all similar, the terminal flowering glume more or less stiffened or enlarged when in fruit almost as in Paniceæ, but the awn twisted and bent as in Andropogoneæ.*

Glumes 4, 2 empty, the third with a male flower or empty. Panicle loose . . . . 35. ARUNDINELLA.
Glumes 3, 2 empty. Panicle dense and spikelike . 36. POLYPOGON.

TRIBE III. **Olyreæ.** *Spikelets 1-flowered, unisexual, the two sexes in the same panicle. Glumes 3, the flowering one large, membranous or hardened enclosing the grain. A palea to the flower. Stamens 6 (or in genera not Australian 3). Styles united at the base or high up. Stigmas feathery, 2 or 3.*

Fruiting glume membranous, globular, with a small orifice. Stamens 6. Stigmas 3 . . . . 37. LEPTASPIS.

B. Poaceæ. *Pedicels not articulate below the glumes. Rhachis of the spikelet articulate above the 2 or 3 lowest glumes, or wholly continuous. Spikelets with 1 or more fertile flowers, the males or imperfect ones if any above or very rarely below them. (In a few Phalarideæ the lower glumes deficient).*

TRIBE IV. **Phalarideæ.** *Spikelets with 1 terminal hermaphrodite flower and rarely 2 male flowers lower down. Glumes 2 to 6 all keeled or with a central nerve, 2 below the articulation of the rhachis persistent or in several genera deficient, 4 or fewer above the articulation, of which 2 enclose the grain without any distinctly 2-nerved palea.*

(In *Phalaris* itself the upper glume is apparently 2-nerved, the central nerve represented by a line of cilia.)

Stamens 6, rarely 3. No glumes below the articulation.
Spikelets very flat. Glumes 2 without any small ones . . . . 38. LEERSIA.
Spikelets very flat. Glumes 4, the 2 outer very small 39. ORYZA.

Spikelets not flattened. Glumes 4, membranous, the 2 outer very small . . . . 40. Potamophila.
Stamens 6 or 4, very rarely 3 or 2. 2 persistent glumes below the articulation.
Stamens 6, rarely 3. Spikelets usually paniculate, awned or unawned . . . . 41. Ehrharta.
Stamens 4, rarely 2. Spikelets paniculate, more or less awned . . . . 42. Microlæna.
Stamens 4. Spikelets not awned . . . . 43. Tetrarhena.
Stamens 3, rarely 2. Glumes 3, none below the articulation.
Flowering glume awned. Panicle dense, cylindrical, spikelike . . . . 44. Alopecurus.
Stamens 3, rarely 2; 2 persistent glumes below the articulation, 2 inner ones enclosing the grain, 2 intermediate ones small or enclosing male flowers.
Panicle spikelike. Spikelets very flat. Intermediate glumes small, unawned, empty or one deficient . 45. Phalaris.
Panicle spikelike. Spikelets narrow. Intermediate glumes small, empty, with a dorsal awn . . . 46. Anthoxanthum.
Panicle loose. Intermediate glumes enclosing male flowers with 2-nerved paleæ . . . . 47. Hierochloe.

Tribe V. **Streptatheræ.**—*Spikelets with* 1, 2, *or rarely several hermaphrodite flowers, and rarely a male flower above or below. Flowering glume usually bearing an awn twisted in the lower part, bent or divided about the middle. Palea* 2-*nerved, usually thin or small, in a few Avenaceæ as large as in Festucaceæ.*

(The awn is very small and straight or deficient in a few species of *Agrostis* and *Deyeuxia*, the twisted portion below the branches very short or obsolete in one section of *Aristida*.)

Subtribe I. **Stipaceæ.**—*Spikelets* 1-*flowered. Awn terminal, simple or* 3-*branched. Lodicules* 3. *Fruiting glume usually narrow, hardened, enclosing the grain.*

Awn 3-branched . . . . 48. Aristida.
Awn simple, at length articulate on the glume . . . 49. Stipa.
Awn simple, continuous with the point of the glume . 50. Streptachne.

Subtribe II. **Agrostideæ.**—*Spikelets* 1-*flowered. Awn either terminal between the lobes of the glume or dorsal, in a few species very small or deficient. Lodicules* 2. *Fruiting glume enclosing the grain, usually thin.*

Awn terminal between the lobes of the glume. Rhachis of the spikelet not continued beyond the flower.
Lobes 2 on each side of the awn. Panicle branched 51. Pentapogon.
Lobes 1 on each side of the reflexed awn. Spikelets in an ovoid-globose head . . . . 52. Diplopogon.
Awn more or less dorsal, sometimes minute or deficient.
No bristle continuing the rhachis beyond the rhachis.
Awn fine and near the tip of the glume. Palea more than half as long as the glume . . . 53. Dichelachne.
Awn dorsal or none. Palea not more than half the glume or minute or none . . . . 54. Agrostis.
Rhachis of the spikelet usually produced into a point or bristle beyond the flower or bearing an empty glume. Awn various. Palea more than half as long as the glume . . . . 55. Deyeuxia.

Subtribe III. **Avenaceæ.**—*Spikelets with* 2 *or in a few genera more than* 2 *perfect flowers* (*only* 1 *in Anisopogon*), *the rhachis produced above them* (*except in Aira*).

Awn either dorsal or terminal between the lobes of the glume. Grain enclosed in the glume and palea and sometimes adnate.

Awn dorsal.
- Flowers both hermaphrodite, the rhachis not at all or scarcely produced. Grain adnate . . . . . 56. AIRA.
- Lower flower hermaphrodite awnless, upper male shortly awned . . . . 57. HOLCUS.
- Lower flower male awned, upper flower hermaphrodite awnless. Grain free. Seed not furrowed 58. ARRHENATHERUM.
- Two perfect flowers. Flowering glumes keeled. Awns attached below the middle. Grain free 59. DESCHAMPSIA.
- Two or three perfect flowers. Flowering glumes keeled. Awns attached above the middle. Grain free, glabrous . . . . 60. TRISETUM.
- Two or more perfect flowers. Flowering glume rounded on the back. Grain pubescent, frequently adnate. Seed deeply furrowed . . . 61. AVENA.
- Several (5 or more) perfect flowers. Flowering glumes rounded on the back. Grain glabrous. Seed deeply furrowed . . . . 62. AMPHIBROMUS.

Awn terminal between the rigid lobes or lateral awns of the glume.
- Spikelets (large with long awns) 1-flowered . . 63. ANISOPOGON.
- Spikelets several-flowered . . . . 64. DANTHONIA.

TRIBE VI. **Astreptæ.**—*Spikelets with several or in a few genera only* 1 *or* 2 *hermaphrodite flowers, the rhachis usually produced and often bearing* 1 *or more empty glumes above them. Flowering glume unawned or with* 1 *or more terminal untwisted awns. Palea prominently* 2*-nerved or* 2*-keeled, usually as long or nearly as long as the glume.*

(The rhachis is not produced above the perfect flowers in *Milieæ* and in a few species of other subtribes).

SUBTRIBE I.—**Pappophoreæ.**—*Spikelets* 1- *or several-flowered, in a dense compound head or in a spikelike or looser panicle. Flowering glumes rounded on the back, with* 3 *or more nerves leading to* 3 *or more terminal lobes or teeth all unawned or the central one or all tapering into untwisted awns.*

(See also 73, CHLORIS, which has often a small awn or narrow lobe on each side of the awn, and a few Festucaceæ have the hyaline tip 2-lobed in front of or on the sides of the awn.)

Spikelets 1-flowered, capitate.
- Rhachis not produced above the flower. Lobes of the flowering glume 3, all with long points or fine awns . . . . 65. AMPHIPOGON.
- Rhachis continued in a small bristle. Lobes of the flowering glume 3, the central one alone awned 66. ECHINOPOGON.

Spikelets with 1 perfect flower and 1 or more males or empty glumes in a short dense or loose panicle. Flowering glume with 9 or in extra Australian species more plumose awns . . . . 67. PAPPOPHORUM.

Spikelets several-flowered, sessile in 2 rows on one side of 1 or 2 simple spikes. Lobes of the flowering glume 3, the central one alone awned . . . . 68. ASTREBLA.

Spikelets several-flowered, paniculate.
- Flowering glume with 3 narrow awned lobes . . 69. TRIRAPHIS.
- Flowering glume with 3 unawned lobes or teeth . 70. TRIODIA.

Subtribe II. **Chlorideæ.**—*Spikelets* 1- *or several-flowered, sessile in simple secund or unilateral spikes, which are either solitary or digitate or scattered on a common rhachis. Flowering glumes usually keeled, entire and unawned, or with* 1, *rarely* 3, *untwisted awns.*

(68. Astrebla has the inflorescence but not the glumes of Chlorideæ.)

Spikelets 1-flowered, awnless, in a simple slender spike, the rhachis of the spikelet not produced above the flower . . . . 71. Microchloa.

Spikelets 1-flowered, awnless, in digitate spikes, the rhachis of the spikelet not at all or minutely produced above the flower . . . . 72. Cynodon.

Spikelets 1-flowered, awned, in a simple or in digitate spikes, with one or more empty glumes above the flowering one . . . . 73. Chloris.

Spikelets several-flowered, awnless or with long-pointed glumes, in digitate or scattered spikes. Grain or seed within the pericarp loose and rugose . . . . 74. Eleusine.

Spikelets several- or rarely 1-flowered, awnless, in scattered spikes. Grain smooth, the pericarp adnate . . . . 75. Leptochloa.

Spikelets several-flowered, awnless in a single or in scattered spikes. Flowering glumes with a minute point between 2 small hyaline lobes . . . . . 76. Diplachne.

Subtribe III. **Milieæ.**—*Spikelets* 1- *or* 2-*flowered in a loose or narrow and dense panicle, the rhachis of the spikelet not produced above the upper flower. Outer glumes usually convex, several-nerved or almost nerveless, unawned. Flowering glumes nearly similar, unawned or with one straight awn. Grain free.*

Rhachis of the spikelet glabrous or nearly so. Outer glumes faintly nerved. Flowering glumes unawned.
- Spikelets 1-flowered . . . . 77. Sporobolus.
- Spikelets 2-flowered.
  - Flowering glumes close together, not hardened round the grain . . . . 78. Micraira.
  - Flowering glumes close together or little distant, hardened as well as the palea round the grain as in Panicum . . . . 79. Isachne.
  - Upper flowering glume raised considerably above the lower, not hardened round the grain . . 80. Cœlachne.

Rhachis of the spikelet hairy round the flowering glumes.
- Spikelets 2-flowered. Outer glumes many-nerved. Flowering glumes awned or unawned . . . . . 81. Eriachne.

Subtribe IV. **Festucaceæ.**—*Spikelets several- often many-flowered in a loose or narrow and dense panicle or capitate, the rhachis of the spikelet usually produced beyond the last flower or ending in an empty glume. Outer glumes usually narrow, acute or rarely obtuse, unawned. Flowering glumes entire or slightly notched, obtuse, acute or the keel or midrib produced into a point or straight awn.*

* *Empty glumes several, either above* 1 *or* 2 *flowering ones or in a separate spikelet.*

Several empty awned glumes above 1 or 2 flowering ones. Panicle narrow and dense or loose and spreading . . . . 82. Ectrosia.

- Many empty glumes above 1 flowering one, all unawned. Panicle contracted into a dense sessile head or interrupted spike . . . . 83. Heterachne.
- Many empty unawned glumes in a separate spikelet from the fertile one. Panicle dense, unilateral . 84. Lamarckia.

** *Only* 1 *empty glume above the flowering ones, sometimes rudimentary or deficient.*

- Rhachis of the spikelet with long hairs enveloping the flowering glumes. Lowest flower male. Panicle large and loose . . . . 85. Phragmites.
- Rhachis of the spikelet glabrous. Spikelets diœcious, few with closely imbricate glumes. Pericarp thick and spongy . . . . 86. Distichlis.
- Rhachis of the spikelet glabrous or shortly or loosely hairy. Spikelets hermaphrodite.
  - Grain free from the palea (except in a few *Poæ*).
    - Spikelets usually flat, the flowering glumes keeled, entire.
      - Flowering glume and palea thinly scarious or hyaline, the glume acute or shortly awned.
        - Spikelets in globular clusters in a long interrupted spike. Palea-keels broadly winged . . . . 87. Elytrophorus
        - Panicle dense and spikelike. Palea not winged . . . . 88. Kœleria.
      - Flowering glumes membranous or herbaceous, 3- or 5-nerved.
        - Spikelets few-flowered, sessile in dense one-sided clusters in a dense one-sided panicle . . . . 89. Dactylis.
        - Spikelets few-flowered in a large loose panicle. Upper glumes bearing reflexed bristles . 90. Centotheca.
        - Spikelets usually many-flowered. Flowering glumes 3-nerved . . . . 91. Eragrostis.
        - Spikelets few-flowered. Flowering glumes 5-nerved . . . . 92. Poa.
    - Spikelets flattened. Flowering glumes with hyaline tips, notched or 2-lobed, the keel forming a small point between the lobes or just below them . . . . 93. Schedonorus.
    - Spikelets narrow. Flowering glumes rounded on the back with 3 or more nerves not reaching to the obtuse hyaline apex . . . . 94. Glyceria.
    - Spikelets broad. Flowering glumes very broad thin and concave almost vesicular . . . . 95. Briza.
  - Grain adnate to the palea when ripe.
    - Ovary pubescent, obtuse. Flowering glumes with a dorsal point or awn below the entire or notched hyaline tip . . . . 96. Bromus.
    - Ovary pubescent, 3-horned. Spikelets very flat. Flowering glumes entire, acute . . . . . 97. Ceratochloa.
    - Ovary glabrous. Spikelets usually narrow. Flowering glumes entire, acute or awned . 98. Festuca.

SUBTRIBE V. **Hordeaceæ.**—*Spikelets 1- or several-flowered, sessile on the opposite sides or alternate notches of the rhachis of a simple spike. Glumes entire, awned or unawned.*

Spikelets several-flowered, flat, one side or face of the spikelet next to the continuous scarcely notched rhachis . . . . 99. AGROPYRUM.

Spikelets several-flowered, flat, one edge of the spikelet next to the continuous notched rhachis . . . . 100. LOLIUM.

Spikelets 1- or 2-flowered, with the rhachis produced above the flower, half embedded in the notches of the more or less articulate rhachis . . . . . . 101. LEPTURUS.

Spikelets 1-flowered, hermaphrodite male or neuter, 3 together in the notches of the rhachis of a dense cylindrical spike . . . . 102. HORDEUM.

Of the conspicuous tribe **Bambusaceæ**, so generally spread over the tropical regions of the New as well as the Old World, no representative has as yet been detected in Australia.

TRIBE I. PANICEÆ. Fertile spikelets with a terminal hermaphrodite or female flower, with or without a male one below it, the pedicel usually articulate immediately under the outer glume. Glumes 4 or 3, the upper flowering one of a firmer texture, the outer empty one usually small, sometimes wanting. A palea to each flower. Lodicules usually rather thick, sometimes minute or wanting. Stamens 3, rarely fewer. Styles free or united at the base, sometimes rather long, with feathery stigmas. Grain enclosed in the hardened or stiffened upper glume and palea, but free from them. Awns rare and when present neither twisted nor bent back.

Paniceæ agree with Andropogoneæ in the articulation of the rhachis of the spikelet being below and usually immediately under the lowest or outer glume, differing chiefly in the relative consistency and development of the innermost and outermost glumes, as well as in the twisted and bent awns frequent (though not constant) in Andropogoneæ, but never present in Paniceæ. The only slightly exceptional genera in Paniceæ are *Chamæraphis* and *Stenotaphrum*, where the fruiting glume and palea are scarcely hardened though not so reduced or hyaline as in Andropogoneæ, and *Cenchrus* and some other involucrate genera, where the articulation is below the involucre.

1. PASPALUM, Linn.

Spikelets 1-flowered, not awned, not callous at the base, in 1 or 2 rows along one side of slender spikes, either forming the branches of a simple panicle, or rarely solitary. Glumes 3, 2 outer ones empty, usually membranous and equal or nearly so, the 3rd flowering of a firmer texture. Palea within the flowering glume smaller and more involute. Styles distinct, rather long. Grain enclosed in the hardened palea and flowering glume, and free from them.

A large tropical and subtropical genus, especially abundant in America, where it is also extratropical. The Australian species are all common in the tropical regions of the Old World, and one is also in America.

Spikes 2 to 5, usually distant. Spikelets orbicular or broadly ovate, obtuse, about 1 line long	1. *P. scrobiculatum*.
Spikes 2, close together or scarcely distant. Spikelets ovate-oblong, acute or acuminate, 1½ to 2 lines long	2. *P. distichum*.
Spikes 2 or 3, digitate or nearly so. Spikelets ovate, about ¾ line long	3. *P. brevifolium*.
Spikes rather numerous, filiform. Spikelets narrow-ovate, about ¾ line long	4. *P. minutiflorum*.

(See also *Panicum gibbosum*, in which the outer glume is deficient.)

P. Sieberianum, Steud. Syn. Glum. i. 17, is the common American *P. conjugatum*, Berg., published as Australian on the authority of the specimens of Sieber's Agrostotheca, n. 127, which are however West Indian.

1. **P. scrobiculatum,** *Linn.; Kunth, Enum.* i. 53.—Erect or ascending, attaining 1 to 2 ft., the Australian specimens glabrous or rarely with a few long hairs at the base of the leaf-blades. Spikes varying from 2 to 5, alternate, spreading, usually distant, 1 to 2 or rarely nearly 3 in. long, the rhachis usually flat and about 1 line broad, and sometimes minutely pubescent at the base. Spikelets sessile or shortly pedicellate in 2 close rows or rarely in part at least of the spike crowded into 3 or 4 rows, ovoid-orbicular, obtuse, flat, about 1 line long when in fruit. Outer empty glumes thinly membranous, with a prominent midrib, sometimes minutely pubescent. Fruiting glume similar in shape but soon hardened, very finely striate, the central nerve visible only in the young state. Palea hardened like the flowering glume, the inflected margins dilated at the base into broad hyaline auricles enveloping the flower.—Trin. Spec. Gram. ii. t. 143; F. Muell. Fragm. viii. 156; *P. orbiculare*, Forst.; R. Br. Prod. 188; *P. polystachyum*, and *P. pubescens*, R. Br. l. c.; *P. metabolon*, Steud. Syn. Glum. i. 19.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* M'Adam Range and Roper River, *F. Mueller;* between Norman and Gilbert Rivers, *Gulliver;* Sweers Island, *Henne;* Escape Cliffs, *Hulse;* Sims Island, *A. Cunningham.*

Queensland. Northumberland Islands, *R. Brown;* Rockingham Bay, *Dallachy;* Port Denison, *Fitzalan;* Percy Island and Port Curtis, *M'Gillivray;* Brisbane River, *F. Mueller.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Woolls;* Hastings and Macleay Rivers, *Beckler;* Clarence River, *Wilcox.*

Frequent in tropical and subtropical Asia and Africa. All or nearly all the Australian specimens belong to the variety still distinguished by some as a species under Forster's name *orbiculare*, usually a more slender plant with smaller spikelets, the rhachis often pubescent at the base, and the outer glumes scarcely or not at all scrobiculate. The marginal indentures and the intermediate nerves between the midrib and the marginal ones of the typical *P. scrobiculatum* are chiefly prominent in cultivated varieties.

2. **P. distichum,** *Linn.; Kunth, Enum.* i. 52.—Stems often creeping and rooting in the sands to a great extent, the ascending extremities varying from short and entirely covered with the leaf-sheaths, to slender 1 ft. long or more with the leaves distant. Leaves either

linear-lanceolate and flat or involute and almost subulate, glabrous or with a few long hairs at the orifice of the sheath and base of the lamina. Spikes 2, close together or the lowest at a distance of 1 to 2 lines, quite glabrous, the rhachis not above ½ line broad. Spikelets sessile in 2 rows, oval-oblong, acute or acuminate, flat, 1½ to nearly 2 lines long. Outer empty glumes equal and distinctly 3-nerved. Fruiting glume hardened and very faintly 3-nerved or the central nerve alone perceptible.—F. Muell. Fragm. viii. 156; *P. littorale,* R. Br. Prod. 188 ; Trin. Spec. Gram. i. t. 112.

Queensland. Rockhampton, *O'Shanesy ;* Condamine River, *Hartman.*
N. S. Wales. Port Jackson, *R. Brown, Woolls, C. Moore ;* Richmond River, *Danger, Mrs. Hodgkinson.*
Victoria. Yarra-Yarra, *F. Mueller.*
W. Australia. Murchison River, *Oldfield.*

Widely distributed over the tropical regions of both the New and the Old World.

3. **P. brevifolium,** *Flügge ; Kunth, Enum.* i. 48.—Stems from a creeping or much-branched base erect, slender, 1 ft. high or rather more. Leaves short, narrow, flat, the sheaths usually villous or pubescent, the ligula scarious, jagged. Spikes or panicle-branches 2 or rarely 3, digitate at the end of the peduncle, filiform, 1 to 2 in. long. Spikelets scattered along one side of the rhachis, on short curved pedicels, ovate, rather obtuse or almost acute, about ¾ line long, sprinkled with short fine appressed silky hairs. Empty glumes 2, rather obtuse, nearly equal, thin, finely 5-nerved.—*Panicum tenuiflorum,* R. Br. Prod. 193.

Queensland. Keppel Bay, *R. Brown ;* Brisbane River, Moreton Bay, *F. Mueller, Bailey ;* Rockhampton, *O'Shanesy ;* Herbert's Creek, *Bowman ;* Archer's Flat, *Leichhardt ;* Rockingham Bay, *Dallachy.*
N. S. Wales. Port Jackson, *R. Brown.*

Var. *propinquum.* Rather taller. Leaves rather longer. Spikes 2 to 3 in. long. —*Panicum propinquum,* R. Br. Prod. 193.

N. Australia. Gulf of Carpentaria, *R. Brown ;* between M'Adam Range and Providence Hill, *F. Mueller.*

The species is widely spread over tropical Asia.

4. **P. minutiflorum,** *Steud. Syn. Glum.* i. 17.—A rather tall glabrous grass, closely resembling at first sight the *Panicum parviflorum,* Br., but with the characters of *Paspalum,* and nearly allied to *P. brevifolium.* Leaves flat, rather long and narrow, the ligula short, not ciliate. Spikes or panicle-branches rather numerous, filiform, alternate or the upper ones clustered, 3 to 5 in. long. Spikelets numerous, very shortly but unequally pedicellate, narrow-ovate, rather acute, about ¾ line long. Empty glumes 2, nearly equal, prominently 3-nerved, glabrous or the margins minutely ciliate. Fruiting glume acute, smooth and shining.

Queensland. Port Curtis, *M'Gillivray.*

Widely spread over tropical Asia. Munro informs me that the *P. Chinense*, Nees in Steud. Syn. Glum. i. 41, referred in Fl. Hongk. to *P. brevifolium*, belongs rather to *P. minutiflorum.*

2. ERIOCHLOA, Humb. and Kunth.

(Helopus, *Trin.*)

Spikelets 1-flowered, without protruding awns, with a callous annular or almost cuplike base, articulate on a short pedicel, in 1 or 2 rows along one side of the slender branches of a simple panicle. Glumes 3, 2 outer ones empty, usually membranous, equal or nearly so, the 3rd or flowering glume shorter, of a firm coriaceous texture, obtuse but tipped with a point or short awn not exceeding the outer glumes. Palea within the flowering glume coriaceous and involute. Styles distinct, rather long. Grain enclosed in the hardened palea and flowering glume and free from them.

A small tropical genus, common to the New and the Old World. The Australian species have both a wide range, at least in tropical Asia.

Spikelets usually above 1½ lines long, the rhachis of the spikes and main axis of the panicle pubescent or hirsute . . . . 1. *E. punctata.*
Spikelets usually under 1½ lines long, the rhachis and main axis glabrous . . . . 2. *E. annulata.*

1. **E. punctata,** *Hamilt.; Kunth, Enum.* i. 72.—An erect grass attaining 2 or 3 ft., glabrous except the inflorescence and sometimes a slight pubescence in the upper part. Leaves rather long, flat or convolute when dry. Spikes or panicle-branches about 5 to 8, distant, erect, secund, the lowest often above 2 in. long, the others gradually shorter, the rhachis as well as the main axis pubescent or hairy. Spikelets all pedicellate, but often rather close, the pedicels 1 to 2 lines long, usually bearing a few long hairs, the spikelet ovoid, acute or shortly acuminate, rather above 1½ lines long, seated on a thick annular or almost cupular disk articulate on the pedicel. Empty glumes membranous, broad and usually 5-nerved, or the inner one rather narrower and sometimes only 3-nerved, both more or less hairy outside and sometimes rather densely covered with long hairs. Flowering glume much shorter, coriaceous, faintly 3- or 5-nerved, obtuse, but the midrib produced into a point or awn as long as the outer glumes as in *Panicum helopus.*—*Milium punctatum,* Linn.; R. Br. Prod. 188; *Paspalum punctatum,* Flügge; Trin. Spec. Gram. t. 155.

N. Australia. Near Providence Hill, *F. Mueller.*
Queensland. Shoalwater Bay, Keppel Bay, Broad Sound, *R. Brown;* Brisbane River, Moreton Bay, *F. Mueller, Prentice;* Springsure, *Wuth.*
N. S. Wales. Bogan River, *Mitchell.*

2. **E. annulata,** *Kunth, Enum.* i. 73.—A smaller and more slender grass than *E. punctata,* the leaves usually narrower, glabrous. Spikes slender, 1 to 1½ in. long, the main axis of the inflorescence as well as the rhachis usually glabrous, the pedicels sometimes bearing a few short hairs. Spikelets narrow, tapering at the end, scarcely 1½ lines long, including the point, which is rather longer than in *E. punctata.* Empty glumes much less hairy than in that species, 3- or rarely 5-nerved. Flowering glume the same.—*Paspalum annulatum,* Flügge ; Trin. Spec. Gram. t. 133.

Queensland. Brisbane River, *F. Mueller, Prentice ;* Rockhampton, *Thozet, Bowman ;* Darling Downs, *Law.*

Var. *acrotricha.* Spikelets rather longer, with long points and rather more hairy, and the hairs of the pedicels more numerous, with a few sometimes also on the rhachis.—*Helopus acrotrichus,* Steud. Syn. Glum. i. 100.

N. S. Wales. Camden County and Castlereagh, *Woolls* ; Maneroa, *Mrs. Calvert ;* also in *Leichhardt's* collection.

The species is by some regarded as a variety of *E. punctata.*

3. PANICUM, Linn.

(Digitaria, *Scop. ;* Echinochloa, *Beauv. ;* Coridochloa, *Nees.*)

Spikelets with 1 terminal hermaphrodite flower and occasionally a male or rudimentary flower below it, rarely awned, variously arranged along the branches of a simple or compound panicle rarely reduced to a simple spike, the partial rhachis very rarely produced beyond the last spikelet; barren awnlike branches none, or very rarely a single one. Glumes usually 4, the outer one smaller than the others, not awned, often very small, deficient only in *P. gibbosum,* the 2nd and 3rd very variable in relative proportions, the 3rd occasionally with a palea with or without 3 stamens in its axil ; 4th or fruiting glume smaller or as long as the 3rd, of a firmer consistence, enclosing a palea and hermaphrodite flower. Styles distinct or very shortly united at the base. Grain enclosed in the hardened fruiting glume and palea, but free from them.

One of the largest genera of Gramineæ, abundantly represented in all tropical countries, a few species extending beyond the tropics in the Old World, and a somewhat larger number in North America. Of the 53 Australian species, 3 are common weeds of warm countries, 13 are more or less generally spread over tropical Asia, most of them extending into Africa, and a few of them found also in America, 2 have as yet been identified only with tropical American species, and 35 are as far as known endemic, although 3 or 4 of them are closely allied to American species. Three species are also recorded as escapes from cultivation.

The great differences in inflorescence, a character admitted as generic in most Gramineæ, has induced the division of *Panicum* into several genera more or less adopted by Nees, Kunth and others, but there are so many intermediate species connecting the different groups or series that I have not succeeded in giving characters positive enough to define them even as sections.

Series I. Digitarieæ. *Spikelets mostly in pairs along the outer or lower side of the simple slender branches of the panicle, one of each pair always pedicellate, the other sessile or on a shorter pedicel, the upper ones of each branch occasionally solitary, the lower ones very rarely clustered. Outer glume usually very small.*

Branches of the panicle often numerous, the lower ones long and verticillate, the upper ones scattered.
  Lowest spikelet of each pair sessile.
    Spikelets 1½ to 2 lines long, more or less silky hairy 1. *P. cænicolum.*
    Spikelets 1 to 1½ lines long, more or less silky hairy 2. *P. divaricatissimum.*
    Spikelets 1 to 1½ lines long, not silky, but the lateral nerves of the third glume ciliate with rigid hairs seated on tubercles . . . . . 3. *P. macractinium.*
  Both spikelets of each pair on long capillary pedicels, one pedicel much longer than the other. Spikelets under 1 line long, glabrous or silky hairy . 4. *P. papposum.*
Branches of the panicle few, digitate or clustered at the end of the peduncle.
  Branches 3 to 8. Spikelets of each pair similar, both fertile, glabrous or softly ciliate . . . . . . 5. *P. sanguinale.*
  Branches usually 2. Spikelets of each pair dissimilar, the upper one fertile, ciliate, with rigid hairs seated on tubercles on the lateral nerves of the 3rd glume, the lower one usually with a male flower only and not rigidly ciliate . . . . . 6. *P. ctenanthum.*
Branches of the panicle scattered or the upper ones approximate, the lower ones rarely clustered and not verticillate.
  Branches usually 2, distant, 1 to 1½ in. long. Spikelets narrow, about 1 line long . . . . . . 7. *P. stenostachyum.*
  Branches usually 3, distant, 1 to 1½ in. long. Spikelets ovoid, about ½ line long . . . . 8. *P. tenuissimum.*
  Branches often numerous, 2 to 6 in. long. Spikelets glabrous, ⅓ to ¾ line long, the lower ones often clustered . . . . 9. *P. parviflorum.*
  Branches often numerous, 2 to 6 in. long. Spikelets narrow, nearly 1 line long, silky hairy . . . 10. *P. Baileyi.*

(The spikelets are usually in pairs also in *P. prostratum*, and occasionally in some others).

Series II. Trichachneæ. *Spikelets silky hairy, or fringed with long hairs, sessile or shortly pedicellate, clustered or rarely in pairs along the rhachis of the simple spike-like panicle or of the 2 or few long erect branches.*

Spike single. Spikelots mostly in pairs, about 1 line long, silky hairy, the outer glume deficient . . . 11. *P. gibbosum.*
Spike-like branches few or spike single. Spikelets mostly clustered, 1 to 1½ lines long, the outer glume present but small and often concealed by the long silky hairs . . . . 12. *P. leucophæum.*
Spike-like branches few. Spikelets 2 to 2½ lines long, fringed with long hairs connected by a prominent nerve or membrane. Glumes with fine points . 13. *P. semialatum.*

Series III. Paspaloideæ. *Spikelets sessile or very shortly pedicellate, in 1 or 2 rows, very rarely in pairs, along the short simple alternate often distant spikes or spike-like branches of the panicle, rarely reduced to a single terminal spike.*

Spikes erect, distant or single. Spikelets usually sessile.
  Spike single, terminal. Spikelets glabrous, singly distant or the lowest in pairs.

Fruiting glume glabrous, rugose . . . . 14. *P. rarum.*

Fruiting glume densely and softly pubescent . . 44. *P. marginatum.*

Spikes several, distant. Spikelets with long silvery-silky hairs.

Spikelets truncate, singly distant . . . . 15. *P. argenteum.*

Spikelets ovoid, often approximate . . . . . 16. *P. holosericeum.*

Spikes several, distant. Spikelets glabrous, in 2 close rows.

Spikelets oblique, 1 to 1½ lines long in 2 close regular rows, 2nd glume broad gibbous, 3rd glume flatter, with a palea in its axil . . . 17. *P. flavidum.*

Spikelets nearly straight, 1 to 1½ lines long, the rows not always regular and sometimes very few in the spike, 2nd and 3rd glumes nearly equal, both empty . . . . 18. *P. gracile.*

Spikelets straight, very obtuse, 1½ to 2 lines long, the rows irregular. Outer glume nearly as long as the others. A male flower in the 3rd glume . . . . * *P. obtusum.*

Spikes usually approximate, erect or at length spreading. Spikelets not so closely sessile and frequently subtended by hairs or bristles.

Spikelets about 1 line long, frequently in pairs. A palea in the 3rd glume. Fruiting glume obtuse, rarely tipped with a minute point . . . . . . 19. *P. prostratum.*

Spikelets nearly 2 lines long, in 2 rows. A broad palea in the 3rd glume. Fruiting glume obtuse, with an awn-like point . . . . 20. *P. helopus.*

Spikelets nearly 2 lines long, in 2 rows. A broad palea in the 3rd glume, which is ciliate with long hairs. Fruiting glume obtuse with a short point 21. *P. Gilesii.*

Spikelets nearly 2 lines long, in 2 rows. 3rd glume empty. Fruiting glume obtuse without any point. Leaves hairy . . . . 22. *P. piligerum.*

(See also the first four species of the *Paniculatæ*).

Spikes distant, at length spreading or reflexed. Spikelets alternate along the rhachis but not close and appearing almost uniseriate.

Leaves pubescent. Spikelets distant on a slender rhachis . . . . 23. *P. polyphyllum.*

Leaves glabrous. Spikelets near together on a flattened rhachis . . . . 24. *P. distachyum*

Leaves glabrous. Spikes reflexed, the rhachis flattened, ending in an awn-like point, and a rigid awn-like bristle under the lowest spikelet . 25. *P. reversum.*

Series IV. **Echinochloeæ.** *Spikelets sessile and crowded in 3 or 4 rows or irregularly along the simple alternate usually secund spikes or spikelike branches of the panicle. Glumes sometimes awned.*

Spikelets about 1 line long, never awned, densely crowded in 4 rows along the rhachis, without hairs or bristles . . . . 26. *P. colonum.*

Spikelets 1½ to 2 lines long, acuminate or awned, crowded and clustered along the rhachis, usually intermixed with rigid hairs or bristles . . . . 27. *P. crus-galli.*

Series V. **Myuroideæ.** *Spikelets not silky, crowded and clustered in a dense continuous or rarely interrupted cylindrical spikelike panicle.*

Spikelets ovoid, obtuse, ½ to ⅔ line long . . . . 28. *P. myosuroides.*

Spikelets acuminate, curved, 1 to 1¼ lines long or rather more . . . . 29. *P. indicum*.
Spikelets acuminate, 2 to 3 lines long. Fruiting glume thin . . . . 30. *P. myurus*.

SERIES VI. **Paniculatæ.** *Panicle-branches usually more or less divided. Spikelets all pedicellate (except sometimes the first four species).*

Panicle-branches scarcely divided. Spikelets few, rarely more numerous, scarcely under 2 lines long. No male flowers.
  Spikelets nearly or sometimes quite sessile. (Species approaching the *Paspaloideæ*.)
    Spikelets 2 to 2½ lines long, mostly distant along the branches . . . . 31. *P. foliosum*.
    Spikelets rather under 2 lines, crowded on the lower part of the branches in a compact panicle, 2nd and 3rd glumes almost equal . . 32. *P. adspersum*.
    Spikelets 1½ lines long, rather crowded on the distant branches of a long and narrow panicle. Outer glume ¼, 2nd ½ as long as the 3rd . . 33. *P. inæquale*.
  Spikelets few, distinctly pedicellate, in a loose spreading panicle.
  Spikelets 2½ to 3 lines long, sprinkled with hooked hairs. Fruiting glume close above the others . 34. *P. uncinulatum*.
  Spikelets 3 lines long, glabrous. Fruiting glume raised above the others on a stipes dilated at the top. Panicle pedunculate . . . . 35. *P. majusculum*.
  Spikelets 2 lines long, glabrous. Fruiting glume raised above the others. Panicle scarcely exceeding the floral leaves . . . . 36. *P. pauciflorum*.
Panicle narrow or spreading. Spikelets numerous, 1 to near 2 lines long. A male flower in the 3rd glume.
  Spikelets crowded on the smaller branches. Glumes acute or acuminate; nerves of the 2nd very prominent and rigidly ciliate . . . . 37. *P. semitonsum*.
  Spikelets crowded or clustered on the smaller branches. Glumes acute or acuminate, not ciliate . . . . 38. *P. antidotale*.
  Spikelets often numerous, shortly pedicellate, not clustered. Glumes acute or acuminate . . . 39. *P. repens*.
  Spikelets numerous, on rather long pedicels. Glumes acute . . . . 40. *P. capillipes*.
  Panicle large. Spikelets obtuse, 1¼ lines long. Fruiting glume rugose . . . . * *P. maximum*.
Spikelets ½ to ¾ line long. No male flower.
  Diffuse or creeping. Panicle-branches few, spreading. Spikelets few and distant, ¾ line long, on short pedicels . . . . 41. *P. pygmæum*.
  Erect. Panicle-branches numerous, capillary. Spikelets ½ line long, on capillary pedicels . . . . 42. *P. trichoides*.
  Ascending or erect. Panicle narrow, rather dense. Spikelets very numerous, ¾ line long. Fruiting glume very gibbous . . . . 43. *P. hermaphroditum*.
Spikelets usually numerous, 1 to near 2 lines long, pedicellate. No male flower.
  Panicle narrow, branches usually few.
    Fruiting glume densely pubescent . . . . . . 44. *P. marginatum*.
    Fruiting glume smooth and shining.

Panicle 1 to 2 in. long. Outer glume ovate, acute. Leaves pubescent . . . . . . 45. *P. lachnophyllum.*
Panicle 1 to 2 in. long. Spikelets about 1 line. Outer glume ovate, acute. Leaves glabrous 46. *P. obseptum.*
Panicle 3 to 4 in. long. Spikelets nearly 2 lines. Outer glume short, broad, truncate. Leaves glabrous . . . . 47. *P. Buncei.*
Panicle spreading with numerous capillary branches.
Panicle-branches scattered, neither clustered nor verticillate.
Spikelets 1 line long, acute. Outer glume acute. A palea in the 3rd glume . . . . . . 48. *P. bicolor.*
Spikelets 1 line long, rather obtuse. Outer glume acute. No palea in the 3rd glume . 49. *P. melananthum.*
Lower panicle-branches clustered but scarcely verticillate.
Spikelets about 1 line. Outer glume acute, half as long as the spikelet. A palea in the 3d glume. Nodes prominently ciliate. Ligula a ring of long cilia . . . . 50. *P. effusum.*
Spikelets of *P. effusum.* Nodes glabrous. Ligula very short . . . . 51. *P. Mitchelli.*
Spikelets about 1 line. Outer glume short, broad, truncate or scarcely acute, nerveless. A palea in the 3rd glume . . . . 52. *P. decompositum.*
Spikelets nearly 2 lines. Outer glume acute. A palea in the 3rd glume. Panicle large. Leaves hairy . . . . * *P. miliaceum.*
Lower panicle-branches verticillate. Outer glume nearly as long as the others. A palea in the 3rd glume.
Ligula very short, with a ring of cilia . . . . 53. *P. trachyrhachis.*
Ligula prominent, scarious, without cilia . . . 54. *P. prolutum.*

SERIES I. DIGITARIEÆ.—Spikelets usually small, mostly in pairs along the outer or lower side of the simple slender branches of the panicle, one of each pair always pedicellate, the other sessile or on a shorter pedicel, the upper ones of each branch occasionally solitary, the lower ones very rarely clustered. Outer glume usually very small.

1. **P. cœnicolum,** *F. Muell. in Trans. Vict. Inst.* 1855, 45.—Stems from a knotty branching base ascending to 1 ft. or more. Leaves flat, usually softly pubescent or villous. Panicle of rather numerous slender simple branches, 3 to 4 in. long, at first erect, at length spreading, the lower ones verticillate, the upper ones alternate and distant or rarely in pairs. Spikelets in pairs, 1 sessile, the other pedicellate, oblong, 1½ to 2 lines long. Outer glume not exceeding ½ line in our specimens, the 2nd rather shorter than the spikelet, 5- or 7-nerved, the 3d 7- to 11-nerved, both more or less silky-hairy and empty. Fruiting glume smooth, acute.

S. Australia. Cudnaka, *F. Mueller* ; near Lake Eyre, *Andrews.*
W. Australia. Fraser's Range, *Dempster.*

2. **P. divaricatissimum,** *R. Br. Prod.* 192.—Stems from a

branching base sometimes under, sometimes much above 1 ft. high. Leaves glabrous or more or less pubescent or softly villous, the ligula not prominent and not ciliate. Panicle of rather numerous rigidly filiform simple branches 3 to 8 in. long, at first erect, at length spreading, the lower ones in a dense verticil, the upper ones alternate and distant. Spikelets in pairs or rarely solitary along the branches, one sessile the other pedicellate, 1 to 1½ lines long, glabrous or covered with long silky hairs spreading when in fruit. Outer glume very small, ovate, obtuse, the 2nd and 3rd nearly equal and both empty or the 3rd rarely with a minute rudimentary palea, the 2nd usually 3-nerved, the 3rd 5-nerved. Fruiting glume ovoid, not gibbous, glabrous, smooth, acute.

There appear to be four rather marked varieties; but scarcely definite enough to be regarded as distinct species.

1. *glaberrimum.* Stems tall, branches of the panicle sometimes more than 8 in. long, the whole plant glabrous. Spikelets 1¼ lines long, glabrous.

Queensland. Rockhampton and neighbourhood, *Thozet*, *O'Shanesy;* Peak Downs, *Burkitt;* Darling Downs, *Law.*

2. *normale.* Foliage glabrous or nearly so. Panicle-branches 4 to 8 in. long. Spikelets 1½ lines long, silky-villous, rarely nearly glabrous.

Queensland. Keppel Bay, *R. Brown.*
N. S. Wales. Port Jackson, *R. Brown.*

3. *ammophilum.* Foliage softly villous. Spikelets small, covered with long silky hairs spreading when in fruit.—*P. ammophilum*, F. Muell. in Trans. Vict. Inst. 1855, 46.

N. S. Wales. Murray and Murrumbidgee Rivers, *F. Mueller*, thence to Mount Goningberi, *Victorian Expedition.*
S. Australia. Lake Amadeus, *Giles.*

4. *radiatum.* Foliage softly villous. Spikelets small, glabrous or nearly so.—*P. radiatum*, R. Br. Prod. 192.

Queensland. Ballandool, *Lockyer;* Armadillo, *Barton.*
N. S. Wales. Port Jackson, *R. Brown.*

3. **P. macractinium,** *Benth.*—Allied to *P. divaricatissimum*, but taller and quite glabrous. Panicle similar, the slender branches rigid, often 6 to 8 in. long, the lower ones in a dense verticil, the upper ones alternate and distant. Spikelets distant in pairs, one almost sessile, the other on a longer pedicel, both fertile and similar, narrow, acute, about 1½ lines long. Outer glume ½ to ¾ line long, ovate-oblong, obtuse, the 2nd nearly as long as the 3rd, 3- or 5-nerved, the margins ciliate, the 3rd rather longer, very prominently 3-nerved, ciliate with rigid hairs proceeding from a row of prominent tubercles. Flowering glume narrow, acute.

Queensland. Rockhampton, *O'Shanesy;* Herbert's Creek, *Bowman;* Warwick, *Beckler;* also in *Leichhardt's* collection.

4. **P. papposum,** *R. Br. Prod.* 192.—Stems from a woolly or silky-villous rhizome 2 ft. high or more. Leaves flat, usually long and

narrow, the lower ones softly pubescent, the upper ones more glabrous; ligula rather long, membranous. Panicle-branches numerous, slender or filiform, spreading, 6 to 8 in. long, the lower ones verticillate, the upper ones alternate and distant. Spikelets in distant pairs, both on capillary pedicels, one pedicel much longer than the other but both long, sometimes 1 to 2 in. at the base of the branches, the upper pedicels shorter and sometimes solitary. Spikelets scarcely 1 line long, covered in the typical form with long silky hairs spreading when in fruit. Outer glume minute or sometimes wanting, 2nd and 3rd equal, 3-nerved, both empty or the 3rd with a rudimentary palea. Fruiting glume rather acute, smooth and shining.

N. Australia. Arnhem South Bay, *R. Brown.*

Var. *leiostachyam.* Spikelets glabrous, otherwise quite similar.—*P. autumnale*, F. Muell. Fragm. viii. 196, but not of Bosc.—Sweers Island, *Henne.*

5. **P. sanguinale,** *Linn.; Kunth, Enum.* i. 82.—Decumbent and often shortly creeping and rooting at the base, ascending to 1 ft. or rather more. Leaves flaccid, flat, usually pubescent and sprinkled with long hairs especially on the sheaths, but sometimes nearly glabrous. Spikes or panicle-branches 3 to 8, crowded at the end of a long peduncle, all from nearly the same point or shortly distant, 1½ to 3 in. or in some varieties above 4 in. long, the rhachis slender but angular, flexuose, scabrous-ciliate. Spikelets in pairs, one nearly sessile the other pedicellate, oblong, rather acute, about 1½ lines long. Outer glume minute, rarely above ¼ line long, 2nd glume lanceolate, 3-nerved, from ½ to ¾ the length of the spikelet, 3rd glume usually 5-nerved, glabrous or slightly ciliate in the Australian specimens, empty. Fruiting glume shorter, smooth.—Trin. Spec. Gram. t. 93, 144; *Digitaria sanguinalis*, Scop.; Reichb. Ic. Fl. Germ. t. 27.

N. Australia. Port Essington, *Armstrong.*

Queensland. Rockhampton and neighbourhood, *O'Shanesy, Bowman* and others; Brisbane River, Moreton Bay, *F. Mueller, Bailey* and others.

N. S. Wales. Port Jackson, *R. Brown, Woolls* and others; Clarence River, *Beckler;* Richmond River, *Mrs. Hodgkinson;* New England, *C. Stuart;* Lord Howe's Island, *C. Moore.*

Victoria. Towang, Hume River, *Finlay.*

W. Australia. Busselton, *Pries.*

A common weed in most warm countries. Most of the Australian specimens have the glumes glabrous or nearly so. Some, however, have them more or less ciliate with soft hairs on the lateral nerves or margins, which constitutes the *P. ciliare*, Retz; Kunth, Enum. 1. 82.

6. **P. ctenanthum,** *F. Muell. Fragm.* viii. 153.—A tufted erect glabrous grass, perhaps annual. Leaves flat, narrow, the ligula prominent and the lamina usually ciliate at the base with a few long hairs. Spikes or panicle-branches 2 together from the end of the peduncle, 1½ to 2½ in. long. Spikelets in rather distant pairs, appressed to the rhachis, one sessile the other pedicellate, both 2 to near 3 lines long, with a minute almost microscopic outer glume, the 2nd glume

lanceolate, ciliate, about ¼ the length of the spikelet, and the 3rd glume empty, but the spikelets otherwise different, the sessile one usually male by abortion though occasionally fertile, the 3rd glume broad, 7- to 9-nerved and ciliate with soft hairs; the pedunculate spikelet rather larger with a hermaphrodite fertile flower, the 3rd glume with only 3 very prominent nerves, ciliate with long rigid bristles arising from tubercles, otherwise glabrous.

N. Australia. Hooker's and Sturt's Creeks, *F. Mueller*; Dampier's Archipelago, *Walcot*.

Munro considers this as very closely allied to the variety *ciliare* of *P. sanguinale*, in which the two spikelets are sometimes dissimilar, but if only a variety it is a very marked one.

7. **P. stenostachyum**, *Benth.*—A tufted slender glabrous grass, branching at the base, 6 in. to 1 ft. high. Leaves flat, the ligula very short scarious and jagged. Spikes or panicle-branches 2, filiform, 1 to 1½ in. long, the terminal one erect, the other spreading and attached lower down. Spikelets appressed to the rhachis, mostly in pairs, one sessile the other on a rather long pedicel, or rarely solitary or both pedicellate, about 1 line long, very narrow, acuminate. Outer glume minute or obsolete, the 2nd and 3rd membranous, rather acute, ciliate, both empty, the 2nd usually 3-nerved, the 3rd rather larger and 5-nerved. Fruiting glume nearly as long, smooth and shining.

N. Australia. Upper Victoria River, *F. Mueller*.

8. **P. tenuissimum**, *Benth.*—Erect, very slender, much branched at the base, often above 1 ft. high. Leaves short and narrow, quite glabrous, the ligula short scarious and jagged. Spikes or panicle-branches few, usually 3, filiform, spreading, distant, 1 to 1½ in. long. Spikelets in pairs, ovoid, quite glabrous, but little more than ½ line long, both pedicellate, but one pedicel twice as long as the other. Outer glume minute, almost microscopic, orbicular, the 2nd and 3rd nearly equal, both empty, obtuse, membranous, 3- to 5-nerved. Fruiting glume rather acute, usually slightly exceeding the empty ones.

Queensland. Brisbane River, Moreton Bay, *F. Mueller*; Rockhampton, *O'Shanesy*.

9. **P. parviflorum**, *R. Br. Prod.* 192.—A tall but slender usually glabrous grass. Leaves long and narrow, the ligula scarious, often long, jagged at the end. Panicle-branches often numerous, spreading, simple, filiform, 2 to 4 in. or in some specimens 5 to 6 in. long, the lower ones distant, the upper ones often crowded. Spikelets ovoid, glabrous, ½ to ¾ lines long, mostly in pairs along the flexuose rhachis, one on a longer pedicel than the other; but in the lower part of the branch often clustered, the longer pedicel bearing 2 or 3 spikelets. Outer glume very small, ovate, usually 1-nerved, 2nd and 3rd glumes nearly equal,

both empty, membranous, obtuse, the 2nd usually 3-nerved, the 3rd 5-nerved. Fruiting glume as long, more acute, smooth.

Queensland. Rockhampton, *O'Shanesy*, *Thozet*; Brisbane River, Moreton Bay, *F. Mueller*, *M'Gillivray* and others.

N. S. Wales. Port Jackson, *R. Brown*, *Woolls*; New England, *C. Stuart*; Clarence River, *Beckler*, *Wilcox*; Richmond River, *Mrs. Hodgkinson*; also in *Leichhardt's* collection.

Var. *pilosa*, more or less hairy.—Moreton Bay, *Bailey*.

P. striatum, R. Br. Prod. 192 (*P. australe*, Spreng. Syst. i. 309), from Botany Bay, *Banks and Solander*, and Port Jackson, *R. Brown*, appears to me to be a form of *P. parviflorum* with the outer glume quite microscopical or in many spikelets deficient, so as to bring it near some *Paspala*, but the spikelets are not flattened and the other characters are those of *P. parviflorum*. *P. ramulare*, Trin. Gram. Pan. Diss. ii. 244, not taken up by Kunth, appears from the character given not to differ from *P. parviflorum*.

10. **P. Baileyi,** *Benth.*—A glabrous rather slender grass of 1½ to 2 feet, with the inflorescence of *P. parviflorum*, but the spikelets rather of *P. divaricatissimum*. Leaves flat, narrow, the ligula shortly prominent, scarious, not ciliate. Panicle of several simple filiform branches of 3 or 4 in., all distant or the upper ones rather crowded or the lower ones sometimes clustered not verticillate. Spikelets narrow-ovoid, rather acute, nearly 1 line long, mostly in pairs, one on a much longer pedicel than the other, or in the lower part of the branch the longer pedicel with 2 or 3 spikelets. Outer glume very small, ovate, 1-nerved, the 2nd and 3rd glumes nearly equal, fringed with rather long hairs spreading when in fruit, the 2nd usually 5-nerved, the 3rd rather broader and 7-nerved. Fruiting glume acute, smooth and shining.

Queensland. Port Curtis, *M'Gillivray*; Brisbane River, *Bailey*.

SERIES II. TRICHACHNEÆ.—Spikelets silky-hairy or fringed with long hairs, sessile or shortly pedicellate, clustered or rarely in pairs along the rhachis of the simple spikelike panicle or of the 2 or 3 long erect branches.

11. **P. gibbosum,** *R. Br. Prod.* 193.—Erect, branching at the base, 1 to 1½ ft. high. Leaves narrow, erect, glabrous except a few hairs at the orifice of the sheaths. Panicle simple, spikelike, slender but dense, 2 to 3 in. long, with a flexuose rhachis, or very rarely 2 spikelike erect branches. Spikelets in pairs along the rhachis, one sessile the other pedicellate or 3 to 6 together in clusters or on short branches at the base of the spike, all narrow, silky-hairy, about 1 line long, with a few long cilia usually at their base, or on the pedicel. Outer glume deficient; empty glumes 2, covered with long silky hairs, the lowest lanceolate, very thin and nerveless, the other rather longer, ovate, very thin but distinctly 3- or 5-nerved. Fruiting glume hard, smooth, somewhat gibbous at the base, with a rather prominent keel.—Kunth, Revis. Gram. t. 105; F. Muel. Fragm. viii. 155

N. Australia. North Coast, *R. Brown*; Victoria River, *F. Mueller*.
Queensland. Rockhampton, *O'Shanesy*.

A variable plant scarcely to be distinguished from the simple spiked forms of *P. leucophæum*, except by the apparently total absence of the minute outer glume, and in this respect this species closely connects *Panicum* with *Paspalum*. Its close affinity to *P. leucophæum* prevents its removal from the former genus.

12. **P. leucophæum**, *H. B. et K. Nov. Gen. et Sp.* i. 97.—Stems from a branching base 1 to 2 ft. high. Leaves narrow, long or short, usually glabrous. Panicle of few long slender and erect spikelike branches, very unequal and sometimes reduced to 2 nearly equal ones or to a single one, the longest 3 to 4 in. or in some very lax Queensland specimens 5 in. long; secondary branches short, slender, erect, the lower ones with 4 or 5 sessile or pedicellate spikelets, the upper ones with only 1 or 2. Spikelets scarcely 1½ lines long, rather acute, densely covered with long silky, silvery or purple hairs, often spreading when in fruit. Outer glume scarcely ¼ line long, obtuse, 2nd and 3rd glumes nearly equal and empty, both densely hairy, the 2nd usually 3-nerved, the 3rd 5-nerved. Fruiting glume shorter, smooth, rather acute and often slightly gibbous at the base.—*P. villosum*, R. Br. Prod. 192; P. *Brownii*, Rœm. and Schult. Syst. ii. 462; F. Muell. Fragm. viii. 155; *P. glareæ*, F. Muell. in Linnæa, xxv. 445; *P. laniflorum*, Nees in Hook. Lond. Journ. ii. 410.

Queensland. Keppel Bay and Broad Sound, *R. Brown;* Rockhampton, *O'Shanesy;* Rockingham Bay, *Dallachy;* also in *Leichhardt's* collection.

N. S. Wales. Western interior, *A. Cunningham;* New England, *C. Stuart;* Clarence River, *Beckler;* Darling River to the Barrier Range and Cooper's Creek, *Victorian and other Expeditions.*

Victoria. Snowy River, *F. Mueller.*

S. Australia. Crystal Brook, *F. Mueller.*

Var. *monostachyum.* Spike simple as in *P. gibbosum*, but the outer glume present. —Goyinga Mountains, *Victorian Expedition.*

Also in tropical America and Africa. The Australian specimens vary much, especially in the degree of development of the inflorescence and the size of the spikelets. Some of Brown's from Shoalwater Bay and Thirsty Sound, originally marked by him as *P. sericeum*, have 10 or more branches to the panicle and smaller spikelets and may possibly prove to represent a distinct species.

13. **P. semialatum**, *R. Br. Prod.* 192.—Stems erect, 2 to 3 ft. high, silky-pubescent about the nodes, otherwise glabrous or nearly so. Leaves narrow with involute margins or subulate, usually pubescent, the lower ones sometimes densely clothed with long silky hairs. Panicle 3 to 6 in. long, consisting of 2 to 5 long erect or slightly diverging branches, clustered at the end of a long peduncle. Spikelets 2 to 2½ lines long, few together in erect clusters or short branches along the rhachis. Glumes all ending in a short subulate point, the outer one membranous, 3-nerved, about half the length of the spikelet, the 2nd the largest, membranous, 5-nerved, fringed on each side with long pale or dark-coloured hairs spreading in fruit and connected at the base on the intramarginal nerve; 3rd glume more rigid though thin, with a small palea and sometimes 3 stamens in the axil. Fruiting glume more

rigid, with a rather longer point, the palea also rigid, but the inflexed margins thin with a distinct lobe at the base on each side.—F. Muell. Fragm. viii. 196; *Urochloa semialata*, Kunth, Enum. i. 74; *Coridochloa semialata*, Nees, in various catalogues and herbaria (the genus not published as generally quoted in Edinb. New Phil. Journ. 1832, July).

N. Australia. Upper Victoria River and M'Adam Range, *F. Mueller*; Escape Cliffs, *Hulse*; Sweers Island, *Henne*; Port Darwin, *Schultz*, *n.* 146, 192, 662, 784, 801; Port Essington, *Armstrong*.

Queensland. Keppel Bay and Broad Sound, *R. Brown*; Endeavour River, *A. Cunningham*; Percy Islands, *Walter*; Port Curtis, *M'Gillivray*; Port Denison and Rockingham Bay, *Dallachy*; Rockhampton, *Thozet*, *O'Shanesy*; Moreton Bay, *C. Stuart*, *Leichhardt*, *M'Gillivray*; Warwick, *Beckler*.

N. S. Wales. Liverpool Plains, *A. Cunningham*; Darling Downs, *Woolls*.

Extends over tropical Asia from Ceylon and the Peninsula to the Malayan Archipelago and South China.

SERIES III. PASPALOIDEÆ.—Spikelets sessile or very shortly pedicellate in 1 or 2 rows, very rarely in pairs, along the short simple often distant spikes or spikelike branches of the panicle, rarely reduced to a single terminal one-sided spike.

14. **P. rarum,** *R. Br. Prod.* 189.—Stems slender, branching and sometimes creeping at the base, ascending to about 1 ft. Leaves very narrow, glabrous or the lower sheaths slightly hispid. Spike simple, slender, 2 to 4 in. long. Spikelets mostly singly sessile and distant, but sometimes in pairs at the base of the spike, one sessile the other pedicellate, all ovoid, obtuse, 1 line long or rather more, glabrous. Outer glume broad, 3- or 5-nerved, about half as long as the spikelet, 2nd and 3rd nearly equal, both membranous, 5-nerved, empty. Fruiting glume acute, transversely rugose, seated on a semi-annular cartilaginous disk.—Kunth, Rev. Gram. t. 15.

N. Australia. Islands of the North Coast, *R. Brown*.

15. **P. argenteum,** *R. Br. Prod.* 190.—Stems erect, under 1 ft. high. Leaves short, flat, softly pubescent. Panicle of few (3 to 5) erect slender distant branches, the rhachis almost filiform. Spikelets few, distant, erect, broadly turbinate and as it were truncate, about 1 line long, crowned by long silvery hairs. Outer glume not half the length of the spikelet, ovate, silky-hairy; 2nd and 3rd glumes both empty and similar, very broad and almost truncate, membranous, nerveless and silky-pubescent in the lower half, several-nerved with silvery-white rather long hairs at the end. Fruiting glume ovoid-oblong, glabrous, smooth.—Trin. Spec. Gram. t. 170.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*. The analytical details in Trinius' plate appear to be taken from the *P. holosericeum*, they do not at all agree with the spikelets examined of Brown's *P. argenteum*.

16. **P. holosericeum,** *R. Br. Prod.* 190.—Stems from a branching

base, erect, slender, mostly under 1 ft. high, more or less hairy as well as the foliage. Leaves short, narrow, acute, very spreading, the nerve-like margins usually undulate. Panicle of few (4 to 6) erect simple distant branches, the longest about ½ in. long. Spikelets usually 5 or 6, alternate, under 1¼ lines long, but appearing longer from the long shining silvery-silky hairs with which they are covered. Outer glume acute, more than half the length of the spike, 2nd glume acute, mucronate, 3-nerved towards the end, 3rd glume nearly similar and empty but rather longer, 5-nerved at the end, with a longer point; fruiting glume much shorter, glabrous, distinctly 3-nerved at the end, with a short point, at length hardened and minutely striate.—Kunth, Rev. Gram. t. 18; Trin. Spec. Gram. t. 173.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* Victoria River, *F. Mueller;* Port Darwin, *Schultz, n.* 14, 113, 136, 138, 830; Arnhem's Land, *McKinlay;* the latter specimens with smaller spikelets, approaching those of *P. argenteum*, but not truncate.

17. **P. flavidum,** *Retz, Obs.* iv. 15.—Stems erect, branching at the base, rather rigid, attaining 1 to 2 ft. or rather more. Leaves acute, sometimes rather broad but the margins involute when dry, glabrous except a few short hairs at the orifice of the sheath. Panicle of several often numerous erect distant branches or sessile spikes, the lowest sometimes above ½ in long, the upper one shorter, the rhachis flexuose, slightly dilated. Spikelets sessile in about 2 rows, in the typical form very oblique, ovoid, about 1¼ lines long or rather more in several Australian specimens. Outer glume very short, broad and obtuse, the second glume the largest, broad, several-nerved, very concave and incurved, the third smaller, flat on the back, enclosing a palea large and broad in the typical form but no stamens. Flowering glumes usually shortly acuminate.—R. Br. Prod. 190; *P. brizoides,* Jacq. f. Ecl. Gram. 2, t. 2, Trin. Spec. Gram. t. 158.

N. Australia. Upper Victoria River, *F. Mueller*; the specimens quite similar to Indian ones.

Queensland. Herbert's Creek, *Bowman;* Peak Downs, *Burkitt;* Springsure, *Wuth*, the spikelets rather larger than usually in India.

Var. *tenuior.* Spikelets rather small, not quite so oblique, the palea within the third glume usually very small, the fruiting glume very rugose.

Queensland. Endeavour River, *Banks and Solander;* Warwick, *Beckler.*

N. S. Wales. Port Jackson, *R. Brown;* Camden, *Woolls;* in the interior, *A. Cunningham;* New England, *C. Stuart.*

The species extends over tropical Asia, but apparently not into Africa or America. It has been united by F. Mueller, Fragm. viii. 189, with the following under the name of *P. brizoides*, Linn., a view in which I am unable to concur. I find great confusion among the different plants to which different authors have given that name. The original *P. brizoides*, Linn., is shown by his herbarium as by his description to be the same as his *P. colonum. P. brizoides* of Retz, Obs. v. 18, and Willd. Spec. i. 338, is evidently the *P. fluitans*, Retz, Obs. iii. 8, which he had originally described imperfectly and therefore failed to recognise, but the specimens originally sent from India show it to be the common Indian semi-aquatic species remarkable in the whole genus by the second glume short and truncate like the first. This species, though so common in India, has not yet been found in Australia. The American plant designated by Swartz as *P. brizoides* and found also in Africa and Asia but not in Australia, and readily known by the male flower in the third glume, is the *P. paspaloides*, Pers., and probably the *P. fluitans* of Retz, Obs. v. 18 and Willd. Spec. i. 338 (not the one formerly so named by Retz). *P. brizoides* of Jacquin and Trinius is as above quoted the *P. flavidum*, Retz.

18. **P. gracile,** *R. Br. Prod.* 190.—Erect, much branched towards the base, quite glabrous, usually slender, from under 1 ft. to above 1½ ft. high, but exceedingly variable in stature and aspect. Leaves from very narrow to rather broad. Panicle usually long and slender, the branches or sessile spikes or clusters erect, distant, the lower ones 3 to 4 lines or rarely ½ to 1 in. long, the upper ones smaller, often reduced to short clusters or to single spikelets towards the end of the panicle, the rhachis of the branches often but not always produced beyond the last spikelet into a point sometimes as long as the spikelet. Spikelets singly sessile or in pairs, one pedicellate the other sessile along the rhachis, rarely more or less distinctly in 2 rows almost as in *P. flavidum*, ovoid, 1 to 1¼ lines long, nearly straight, the outer glume ovate acute rather less or more than half as long as the spikelet, the second and third nearly equal, both empty membranous and about 5-nerved, fruiting glume as long or rather longer, minutely transversely rugose.

N. Australia. Port Essington, *Armstrong*.

Queensland. Keppel Bay, *R. Brown*, an elongated form with very narrow leaves, and the spikelets irregularly arranged almost clustered on the lower branches; Rockingham Bay, *Dallachy*, and numerous localities in southern Queensland, *O'Shanesy*, *Thozet*, *Bowman* and others, and a var. with very small spikelets; Herbert's Creek, *Bowman*.

N. S. Wales. New England, *C. Stuart*; Shoalhaven, *C. Moore*; Clarence River, *Wilcox*, a very narrow-leaved form with only 3 or 4 spikelets even on the lower branches of the panicle; in the western interior, *A. Cunningham*, *Mitchell*, *Giles* and others.

Victoria. Mount Hope and Murray River, *F. Mueller*.

S. Australia. Wulpena and Cudnaka, *F. Mueller*.

W. Australia. *Drummond*, *1st coll.*, also n. 101, the latter a very small plant, with few spikelets.

P. jubiflorum, Trin. Gram. Panic. Diss. ii. 150, was described from a remarkably luxuriant specimen of *P. gracile* gathered by Mitchell, with a panicle nearly 1 ft. long and the lower spikelet about 1 in., with rather numerous spikelets in 2 rows; other specimens of Mitchell's are not half that size. *P. distans*, Trin. Spec. Gram. t. 172, represents the slender depauperate form as gathered by Drummond and others. *Paractænum Novæ-Hollandiæ*, Beauv. Agrostogr. 47, t. 10, f. 6, (*Panicum paractænum*, Kunth, Enum. i. 134), appears to me from the figure and description, also to refer to a starved form of the species, but not so slender as the above-mentioned *P. distans*. The variations of *P. gracile* are however sometimes so great that it is difficult to reduce all the forms to one species without having seen the almost insensible gradations which unite them.

To this first group of *Paspaloid Panica* may be referred also the *P. culicinum*, F. Muell. Fragm. viii. 189, which is *P. obtusum*, H. B et K., a Mexican grass raised in the Warrego district of Queensland as 'Mosquito grass,' a name unknown in Mexico, but under which, as we learn in a note of J. Gay's, seeds were originally transmitted from Washington to Paris, the name probably derived from some confusion with the *Mezquite*, the pod of a *Prosopis*. The species is easily distinguished among *Paspaloid*

Panica by the large obtuse spikelets, with the outer glume nearly as long as the others, and with a male flower in the third glume.

19. **P. prostratum,** *Lam. Illustr.* i. 171.—Stems decumbent or creeping and rooting at the base, ascending to 1 ft. or more. Leaves lanceolate, 1 to 2 in. long or in luxuriant specimens twice as long, glabrous except a few cilia at the base of the lamina and orifice of the sheath, or sometimes with the sheath more hairy. Panicle of 3 to 10 simple branches 1 to 1½ in. long, usually crowded at the end of the peduncle, but sometimes more distant and spreading. Spikelets rather crowded along the rhachis, but often in pairs, 1 sessile the other pedicellate, or rarely the lower pedicels bearing 2 spikelets, ovoid, rather above 1 line long and almost acute, glabrous but occasionally with a few capillary bristles on the rhachis and pedicels. Outer glume very short and broad, obtuse or almost acute, the 2nd and 3rd nearly equal, 3- or 5-nerved, the 3rd with a large palea and sometimes a male flower in its axil. Fruiting glume smooth, very obtuse, but occasionally tipped by a minute point.—Trin. Spec. Gram. t. 184, 185.

N. Australia. Upper Victoria River, *F. Mueller;* Gulf of Carpentaria, *Lansborough.*

Generally distributed over tropical Asia, it is also in Africa and the West Indies.

20. **P. helopus,** *Trin. in Spreng. Neue Entd.* ii. 84.—Stems usually rather tall. Leaves lanceolate, often rather broad and cordate at the base with loose sheaths, usually more or less hirsute especially the sheath, but sometimes nearly glabrous. Panicle of few simple branches, sometimes 3 to 5 almost sessile above the last leaf, sometimes 6 or 7 on a rather long peduncle. Spikelets irregularly alternate in 2 rows along the rhachis, or the lower ones clustered and the upper ones more distant, ovoid, acute, nearly 2 lines long, pubescent villous or glabrous. Outer glume very short and broad, 3-nerved, the 2nd about 7-nerved, the 3rd about the same length but narrower, 5-nerved, with a palea in its axil but no stamens. Fruiting glume minutely rugose, obtuse, but the central nerve produced into a short awnlike point not exceeding the empty glumes.—Trin. Spec. Gram. t. 183; *Urochloa pubescens*, Beauv.; Kunth, Enum. i. 74; *U. panicoides*, Beauv. Agrost. 52, t. 11; Kunth. l. c. and Revis. Gram. t. 14.

N. S. Wales. Darling River, *Dallachy*, and thence to Cocper's Creek, *Neilson.*

Var. *glabrior.* Spikelets more numerous, loosely and irregularly arranged along the rhachis.

N. Australia. Lower Victoria River, *F. Mueller.*

The species is common in tropical Asia and Africa. It is readily known by the point or short awn of the fruiting glume resembling that of *Eriochloa punctata*, of which the plant has also something of the aspect, but the spikelet has the outer glume developed and is not seated on the peculiar disk-like base of that genus. Kunth having adduced as a synonym to *U. panicoides*, *P. javanicum*, Poir., that name has been adopted as the oldest by Steudel and others, but Poiret's description does not apply to our plant, and Munro has seen authentic specimens which are quite different.

21. **P. Gilesii,** *Benth.*—Stems 6 to 10 in. high, leafy to the top, with a few long hairs scattered on the leaf-sheaths, the lamina flat. Panicle of 2 or 3 simple branches, close together and half enclosed in the uppermost leaf-sheath in all the specimens seen, under 1 in. long. Spikelets closely resembling in size and shape those of *P. helopus*, ovoid, acute or acuminate, 1½ lines long or rather more, sessile in 2 rows on a glabrous rhachis. Outer glume minute, hyaline, concealed by the long hairs which cover it; 2nd glume prominently 7-nerved, acute or acuminate, shortly hairy; 3rd about the same length, 3- or 5-nerved, bordered on each side below the middle by long spreading hairs, with a broad hyaline palea in its axil; fruiting glume much shorter, coriaceous, obtuse with the point or short awn of *P. helopus.*

Central Australia. Charlotte Waters, *Giles.*

22. **P. piligerum,** *F. Muell. Herb.*—Closely resembles some of the longer more hairy specimens of *P. helopus.* Leaves rather narrow, 6 to 8 in. long. Panicle of 3 to 5 erect simple branches 1 to near 2 in. long. Spikelets ovoid, acute, nearly 2 lines long, alternate along the rhachis but rather distant so as to appear in a single row. Glumes hairy, the outer one short, 3-nerved; 2nd and 3rd glume 5-nerved, the third rather narrower than the 2nd but both empty and equal in length. Fruiting glume shorter, coriaceous, obtuse, without any or only a very minute and deciduous terminal point, minutely transversely rugose.

N. Australia. Victoria River, *F. Mueller.*

23. **P. polyphyllum,** *R. Br. Prod.* 190.—Stems from a decumbent and branching base lengthening and ascending to above 2 ft. Leaves lanceolate, pubescent, with nerve-like frequently undulating margins. Panicle slender, of few distant simple slender secund and spreading branches, the lower ones 1 to 1½ in. long, the upper ones shorter. Spikelets rather distant along the rhachis, alternate but not in 2 distinct rows, ovoid, acute, about 1½ lines long, contracted at the base and sometimes shortly pedicellate, with a few hairs or bristles on the pedicel. Outer glumes thinly membranous, the lowest about half as long as the spikelet, broad, rather acute, 3-nerved, the 2nd and 3rd nearly equal, the 2nd with five, the 3rd with three prominent nerves. A narrow palea in the 3rd glume. Fruiting glume smooth or minutely rugose under a strong lens.—Trin. Spec. Gram. t. 177; F. Muell. Fragm. viii. 194.

N. Australia. Islands off the North Coast, *R. Brown;* Port Essington, *Armstrong;* Port Darwin, *Schultz, n.* 34, 148, 191, 818.

24. **P. distachyum,** *Linn.; Kunth, Enum.* i. 91.—Stems decumbent or creeping and rooting at the lower nodes, slender and ascending to 1 ft. or rather more. Leaves flat, glabrous or with a few hairs especially at the orifice of the sheaths. Panicle of few (usually 2 to 4 but occasionally 6 or 7) distant simple secund branches 1 to 2 in. long, at first erect, at length spreading or reflexed, the rhachis slender or slightly dilated, often sprinkled with a few hairs. Spikelets sometimes loosely alternate along the rhachis almost in a single row, sometimes more numerous and approximate in 2 distinct rows, sessile or shortly stipitate, ovoid, rather acute, 1½ lines long, quite glabrous. Outer glume scarcely half the length of the spikelet, thin, very broad, the margins overlapping each other, 2nd and 3rd glumes nearly equal, prominently 3-nerved; a narrow palea in the 3rd. Fruiting glume nearly as long, very obtuse, hardened but the 3 nerves very visible.—*P. subquadriparum*, Trin. Spec. Gram. t. 186 (with a loose sparing inflorescence).

Queensland. Rockhampton, *O'Shanesy; Bokhara Flats, Leichhardt.*
S. Australia. Near Lake Eyre, *Andrews.*

Widely distributed over East India and the Malayan Archipelago.

25. **P. reversum,** *F. Muell. Fragm.* viii. 152.—A weak glabrous rather glaucous much-branched grass. Leaves long and narrow. Panicle usually of 3 or 4 simple distant branches, at first erect but soon spreading, and at length reflexed like those of *P. distachyum*, but the rhachis generally though not always dilated, produced into a rigid point beyond the last spikelet, and bearing under the lowest spikelet a rigid linear bristle (an abortive branch?) as long as the spikelet. Spikelets not numerous, alternate and distant along the rhachis so as to appear in one row, ovoid-oblong, fully 2 lines long in some specimens, rather under 2 lines in Drummond's. Outer glume 3-nerved, obtuse, at least ¾ the length of the spikelet, 2nd and 3rd glumes equal, many-nerved, both empty in the spikelets I examined, but F. Mueller found a palea in the 3rd. Fruiting glume hardened as in the genus.

S. Australia. Near Lake Eyre, *Andrews; Lake Amadeo, Giles.*
W. Australia, *Drummond; Murchison River, Oldfield.*

This species seems to show some distant approach in inflorescence to the *Plagiosetum refractum.*

SERIES IV. ECHINOCHLOÆ.—Spikelets sessile and crowded in 3 or 4 rows or irregularly, along the simple alternate usually secund spikes or spikelike branches of the panicle. Glumes sometimes awned.

26. **P. colonum,** *Linn.*—Stems erect or decumbent at the base, 2 ft. high or more. Leaves flat, glabrous. Panicle of several (about 8 or 10) simple one-sided distant and usually erect branches or sessile spikes, ½ to ¾ in. long, and not diminishing much upwards. Spikelets about 1 line long, ovoid, sessile and densely crowded in about 4 rows,

the rhachis without bristles but occasionally a few small empty scales (abortive spikelets?) at the base of the spike. Outer glumes coarsely pubescent or nearly glabrous, the lowest nearly half as long as the 2nd and 3rd, which are nearly equal, often ending in short points but not awned; a palea in the 3rd glume. Fruiting glume smooth and shining.—Trin. Spec. Gram. t. 160; *Oplismenus colonum,* Kunth, Enum. i. 142.

N. Australia. Port Essington, *Armstrong;* Upper Victoria River, *F. Mueller.*

Common in the tropical and subtropical regions of the Old World and in many parts of America. F. Mueller, Fragm. viii. 198, unites it with the *P. crus-galli,* and the Australian specimens show perhaps some approach to that species, but the small awnless spikelets in more regular spikes, and the absence of any bristles on the rhachis, refer them rather to the tropical *P. colonum.* The figure of Jacq. f. Ecl. Gram. t. 32 does not appear to me to represent the true *P. colonum.*

27. **P. crus-galli,** *Linn.*—A coarse decumbent annual, ascending to 1 or 2 ft. the leaves rather broad, without any ligula. Panicle dense and usually secund, of simple branches or sessile spikes, the lowest 1 to 2 in. long, the upper ones gradually shorter, the whole panicle in some varieties densely hispid with the long purplish or green awns. Spikelets about 1½ lines long, more or less pubescent, acuminate or awned, crowded and clustered along the branches, the rhachis usually bearing numerous cilia or capillary bristles amongst or below the spikelets. Outer glume very short and broad, 2nd and 3rd glumes nearly equal and 3-nerved, usually ciliate on the margins, the 2nd produced into a rather short awn, the 3rd in the common Australian form with an awn varying from ½ to 1 in., and a thin palea and very rarely a male flower in its axil. Fruiting gloom smooth and shining, without any or only a very short point.—R. Br. Prod. 191; F. Muell. Fragm. viii. 198; Trin. Spec. Gram. t. 161, 162; *Oplismenus crus-galli,* Kunth, Enum. i. 143; *Echinochloa crus-galli,* Beauv.; Reichb. Ic. Fl. Germ. t. 29.

N. Australia. Victoria River and M'Adam Range, *F. Mueller.*

Queensland. Port Molle, *A. Cunningham;* Port Denison, *Fitzalan;* Brisbane River, Moreton Bay, *F. Mueller* and others; Rockhampton and neighbourhood, *O'Shanesy* and others.

N. S. Wales. Paterson River, *R. Brown;* Port Jackson to the Blue Mountains and northward to New England, *Woolls, C. Moore, C. Stuart* and others.

Victoria. Wimmera, *F. Mueller.*

W. Australia. Swan River, *Helmich.*

A common weed in most hot and some temperate countries and very probably only as an introduced weed in several of the Australian localities, most frequently the long-awned state of the plant, but occasionally with the awns short or reduced to short points as is frequently the case in Europe.

P. lacunarium, F. Muell. in Trans. Vict. Inst. 1855, 47, from around the lagoons of the Murray, is reduced by F. Mueller, viii. 198, to a variety of *P. crus-galli.* The panicle is narrower than usual with fewer more distant branches, no cilia on the rhachis, the spikelets rather large, mostly about 2 lines long, without awns and glabrous or the nerves minutely scabrous, and there appears to be always a male flower in the third glume. The specimens much resemble a few of the awnless European ones, but the above characters may possibly prove constant.

SERIES V. MYUROIDEÆ.—Spikelets not silky, crowded and clustered in a dense continuous or rarely interrupted cylindrical spikelike panicle.

28. **P. myosuroides,** *R. Br. Prod.* 189.—Erect or slightly decumbent at the base, often 2 ft. high. Leaves long and narrow, glabrous. Spikelets ovoid, obtuse, ½ to ⅔ line long, clustered and crowded in a continuous and dense cylindrical spike or spikelike panicle 1 to 4 in. long and not above 2 lines diameter, often dark-coloured. Outer glume ovate, acute or acuminate, about half the length of the spikelet, 3-nerved; 2nd and 3rd glumes nearly equal, broad, 5- or 7-nerved; a minute palea in the axil of the 3rd.—*P. angustum*, Trin. Spec. Gram. t. 334.

N. Australia. Victoria River, *F. Mueller;* Port Darwin, *Schultz*, n. 344.

Queensland. Endeavour River, *Banks and Solander, A. Cunningham;* Dawson River, *F. Mueller.*

The species extends over tropical Asia and Africa, but is less common than the *P. indicum*, with which it is united in the Hong Kong Flora and by F. Mueller, Fragm. viii. 197. It appears however to be constantly distinct in the very small obtuse spikelets with straight glumes very rarely and only slightly ciliate.

29. **P. indicum,** *Linn.; Kunth, Enum.* i. 133.—Stems decumbent at the base, ascending to 6 or 8 in. in the smaller varieties, above 1 ft. high in the larger ones. Leaves narrow. Spikelike panicle cylindrical, continuous or rarely interrupted, ½ to 1 in. or in some varieties 2 in. long. Spikelets crowded, narrow, acuminate and more or less curved, 1 to 1½ or rarely nearly 2 lines long. Outer glume 3-nerved, about half the length of the spikelet or rather more, 2nd glume curved and gibbous at the base, often ciliate, 7- or 9-nerved, 3rd glume the same length but straighter and neither gibbous nor ciliate, with a small palea in its axil; fruiting glume considerably shorter.—F. Muell. Fragm. viii. 197; Trin. Spec. Gram. t. 197.

N. Australia. Near M'Adam Range, *F. Mueller;* Port Darwin, *Schultz, n.* 184; between Norman and Gilbert Rivers, *Gulliver.*

Queensland. Endeavour River, *Banks and Solander;* Wide Bay and Brisbane River, *Leichhardt;* Moreton Bay, *C. Stuart.*

N. S. Wales. Paramatta, *Woolls.*

Widely dispersed over tropical Asia and Africa. *P. phleoides*, R. Br. Prod. 189, is almost exactly the typical form represented in Herb. Linn., small and slender, with a short spike of ½ to 1 in. and rather small spikelets. *P. arcuatum*, R. Br. l. c. is the larger perhaps the most common form, with rather larger more curved spikelets, in a spike of 1 to 2 in. The two run very much into each other.

30. **P. myurus,** *Lam.; Kunth, Enum.* i. 86.—A tall grass, the lower part when under water often thick and rooting at the nodes, the upper part erect, 2 to 4 ft. high, quite glabrous. Leaves flat, the lower ones sometimes ½ in. broad. Panicle cylindrical, dense and spikelike, or lobed and interrupted at the base, 8 in. to above 1 ft. long. Spikelets crowded along the short erect branches. Outer glume thin and

hyaline, 1-nerved, mucronate-acute, under 1 line long, inserted (always ?) at some distance below the others; 2nd glume 2 lines long, 3-nerved, tapering to a fine point, 3rd still longer with a longer point, 3- or 5-nerved, usually with a small palea in the axil. Flowering glume shorter, thin and hyaline at the time of flowering, slightly stiffened but not hardened round the fruit.—*Hymenachne myurus*, Beauv. Agrost. 49, t. 10. f. 8, and with some other species, Nees, Agrostol. Brasil. 273; *P. interruptum*, Willd.; Kunth, Enum. i. 87.

Queensland. Trinity Bay, *Bailey.*

A rather common tropical grass in the New and the Old World. The thinner consistency of the fruiting glume might justify the taking the species as the type of a section, but scarcely of a distinct genus.

SERIES VI. PANICULATÆ.—Panicle-branches usually more or less divided. Spikelets all pedicellate, except in the first four species which approach the Paspaloideæ.

81. **P. foliosum,** *R. Br. Prod.* 191.—Stems 1 to 2 ft. high, decumbent at the base. Leaves rather broad, usually pubescent, the nerve-like margins often undulate. Panicle loose, with few distant simple branches, the rhachis flexuose and slender, the lower branches sometimes 2 to 3 in. long. Spikelets few, distant, almost sessile or distinctly pedicellate, and the lower pedicels sometimes bearing 2 spikelets, all above 2 lines long in the typical form, ovoid, acute, pubescent or glabrous. Outer glume about half as long as the spikelet, very broad, acute, with about 7 nerves, 2nd and 3rd glumes nearly equal, 5- or 7-nerved; a rather broad palea in the 3rd. Fruiting glume minutely rugose without the point of *P. helopus* and its allies, but usually with a short callous incurved tip.—F. Muell. Fragm. viii. 194.

Queensland. Bustard Bay, *Banks and Solander*; Keppel Bay, *R. Brown*; Rockhampton, *O'Shanesy, Thozet*; Moreton Bay, *F. Mueller, Leichhardt, C. Stuart.*

N. S. Wales. Clarence River, *Beckler.*

Var. ? *Petiveri.* Panicle smaller but rather more branched. Spikelets more numerous and much smaller, under 2 lines long, the lower ones on the lower primary branches sometimes several together on short secondary branches.—*P. Petiveri*, Trin. Spec. Gram. t. 176. To this variety, common in India, appear to belong some specimens from the islands off the North Coast, *R. Brown*, which I presume to be those described as *P. pubescens*, Br. Prod. 190.

82. **P. adspersum,** *Trin. Spec. Gram. t.* 169.—Stems ascending to 1 ft. or rather more, glabrous except the ciliate nodes. Leaves flat, rather broad and short, the sheaths broader upwards, prominently ciliate, the lamina almost cordate at the base, with a very short ciliate ligula. Panicle narrow, rather dense, 1½ to 3 in. long, with several erect or slightly spreading branches, all glabrous without any or with very few small cilia under the spikelets. Spikelets ovoid, rather acute, quite glabrous, 1½ to near 2 lines long, crowded or clustered in the lower part of the branches, singly sessile towards the end. Outer

glume ¼ to ⅓ as long as the spikelet, rather acute, 1- or 3-nerved; 2nd and 3rd glumes nearly equal, the 2nd broad, usually prominently 7-nerved, the 3rd narrower, with about 5 nerves, and enclosing a long palea. Fruiting glume tipped with a minute point and minutely transversely rugose.

S. Australia. Near Lake Eyre, *Andrews*.

Trinius's plant is from San Domingo in the West Indies, and if it were not on the authority of Munro, I should have great hesitation in uniting with it this one from Central Australia, but I can find nothing to separate the specimens from these two distant regions, although Trinius's figure represents a much looser and less copious inflorescence than that of the Australian plant.

33. **P. inæquale,** *F. Muell. Fragm.* viii. 189.—Stems erect, 1 to 2 ft. high. Leaves rather long and narrow, glabrous except a few hairs at the orifice and sometimes on the upper part of the sheaths. Panicle long and narrow, secund, the branches distant, the upper ones short and simple, the lower ones ½ to 2 in. long, slender, simple or with a few short branches and sometimes in pairs. Spikelets alternate along the rhachis, sessile or nearly so, quite glabrous, about 1½ lines long. Outer glume about ¼ the length of the spikelet, very broad and obtuse, prominently 5- or 7-nerved, the 2nd glume about twice the length of the lowest and half the 3rd, very broad and obtuse, prominently 9- to 13-nerved; 3rd glume many-nerved like the 2nd but more acute, grooved on the back, the margins inflexed or involute, with a large palea in its axil. Fruiting glume shorter, acuminate, more or less curved, contracted at the base, transversely rugose.

Queensland. Dawson River, *F. Mueller*; Herbert's Creek, *Bowman*, in the latter specimens the rhachis of the panicle-branches is sometimes produced beyond the last spikelet into a short awnlike point almost as in *Chamæraphis*.

34. **P. uncinulatum,** *R. Br. Prod.* 191.—Glabrous erect and much branched, attaining sometimes 8 ft. (*F. Mueller*), the nodes often much thickened. Leaves flat, narrow, tapering into fine points. Panicle terminal, loose and slender, consisting of few distant spreading simple or scarcely divided branches, the rhachis almost filiform. Spikelets few and distant along the branches, usually purplish, 2½ to 3 lines long. Outer glume lanceolate, about half the length of the spikelet, the 2nd and 3rd nearly equal, acutely acuminate, 7- or sometimes 9-nerved, sprinkled with short erect rigid hooked hairs; a small palea in the 3rd. Fruiting glume smaller, quite smooth.

Queensland. East Coast, *R. Brown*; Wide Bay, *Leichhardt*; Burnett River, *F. Mueller*; Herbert's Creek, *Bowman*; Rockhampton, *O'Shanesy*, *Thozet*; Warwick, *Beckler*.

35. **P. majusculum,** *F. Muell. Herb.*—Erect, rigid, but not stout. Leaves flat, sprinkled with a few long hairs, the orifice of the sheath ciliate with long hairs, but no prominent ligula. Panicle of few slender spreading rather rigid slightly divided branches, each bearing 1 or 2 spikelets on filiform pedicels. Spikelets nearly 3 lines long,

ovoid, acute, straw-coloured, glabrous. Outer glume half the length of the spikelet or rather more, broad, acute, 3-nerved; 2nd and 3rd equal, acutely acuminate, 7-nerved, both empty. Fruiting glume obtuse, smooth, raised above the others by a stipes or prolongation of the rhachis, dilated into an orbicular disk or membrane under the glume.

N. Australia. Victoria River, *Elsey.*

36. **P. pauciflorum,** *R. Br. Prod.* 191.—A low much-branched grass, more or less sprinkled with long spreading hairs, rarely quite glabrous. Leaves narrow, with short sheaths, the ligula very short or scarcely prominent, ciliate. Panicles in the axils of the numerous floral leaves, often scarcely exceeding them, reduced to very few unequal spreading capillary branches, each bearing 1 to 3 spikelets, all pedicellate, glabrous, acute, about 2 lines long. Outer glume broad, fully half as long as the spikelet, acute, 3- or 5-nerved; 2nd and 3rd nearly equal, acutely acuminate, finely 5- or 7-nerved; a minute palea in the 3rd. Fruiting glume oblong, rather acute, smooth and shining, not much above half the length of the other glumes, but raised above them by a stipes or prolongation of the rhachis bordered under the spikelet by a broad short hyaline membrane.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown.*

Var. *fastigiatum*, very much branched and leafy, the inflorescence not exceeding the floral leaves.—Upper Victoria River, *F. Mueller;* in the interior, *M'Dougall Stuart;* near Alice Springs, *Giles.*

37. **P. semitonsum,** *F. Muell. Herb.*—Erect, slender, apparently about 2 ft. high. Leaves narrow, glabrous, the ligula scarcely prominent, minutely ciliate. Panicle narrow, erect, not much branched, 3 to 6 in. long, the primary branches rather distant, the secondary ones very short, sometimes reduced to clusters of 2 or 3 spikelets. Spikelets rather crowded, very shortly pedicellate, nearly 2 lines long. Outer glume acute or acuminate, from ⅓ to above ½ the length of the spikelet, with 3 prominent shortly serrate-ciliolate nerves; 2nd glume acutely acuminate, with 3 or 5 very prominent tuberculate ciliate nerves; 3rd rather larger and more obtuse, thinner, with 5 or 7 nerves and sometimes a few cilia at the top, enclosing a male flower with a large acute palea. Fruiting glume rather shorter, narrow, acute, smooth.

N. Australia. Victoria River, *Elsey;* near Providence Hill, *F. Mueller.*

38. **P. antidotale,** *Retz; Kunth, Enum.* i. 125.—A tall glabrous grass. Leaves flat, flaccid, the ligula very short and jagged or almost ciliate. Panicle pedunculate, loose, narrow and 3 or 4 in. long in some specimens, spreading and 8 in. to 1 ft. in others, with divided filiform branches, the lower ones usually clustered. Spikelets crowded on the short ultimate branches, in sessile clusters or short spikes, but shortly pedicellate in the clusters, more acuminate than in *P. repens*, 1¼ to 1½ lines long. Outer glume less than ½ the length of the spikelet and sometimes only ¼, broad, acute; 2nd and 3rd glumes nearly equal,

acuminate, almost mucronate, about 7-nerved; a male flower in the 3rd. Fruiting glume scarcely shorter, rather acute, smooth and shining.

N. Australia. North-west Coast, Point Cunningham, Cygnet Bay, *A. Cunningham;* Enderby Island, *Walcot.*

39. **P. repens,** *Linn.; Kunth, Enum.* i. 103.—Stems from a creeping and rooting base ascending to 1 or 2 ft., rather stiff, the nodes glabrous. Leaves narrow, more or less pubescent or hairy or sometimes quite glabrous; ligula short, ciliate. Panicle narrow, with a few long branches, erect or at length spreading, the spikelets shortly pedicellate, irregularly crowded on short secondary branches, with a filiform flexuose rhachis. Spikelets 1½ lines long, glabrous, or the nerves of the glumes minutely ciliolate. Outer glume less than ⅓ the length of the spikelet, acute, 1-nerved; 2nd and 3rd glumes nearly equal, acute or acuminate, prominently 3- or 5-nerved; a male flower in the 3rd. Fruiting glume acute, smooth or minutely rugose.—*P. arenarium,* Brot. Phyt. Lusit. i. 15, t. 6; *P. airoides,* R. Br. Prod. 190.

N. Australia. Gulf of Carpentaria, *R. Brown, F. Mueller;* Port Darwin, *Schultz, n.* 663; Sweers Island, *Henne.*

Queensland. Endeavour River, *Banks and Solander.*

N. S. Wales. Glendon, *Leichhardt;* Murray River, *F. Mueller,* perhaps introduced.

The species is common in maritime districts in southern Asia, northern Africa and southern Europe, and apparently also on the coasts of Brazil.

40. **P. capillipes,** *Benth.*—Foliage of the glabrous varieties of *P. repens* and spikelets similarly 2-flowered, but the inflorescence nearer that of *P. decompositum.* Leaves narrow and rather long, the ligula scarcely prominent. Panicle at length exserted from the last leaves, not very spreading, 3 to 6 in. long, with numerous capillary flexuose divided branches, the lower ones clustered. Spikelets all on capillary pedicels, rather above 1 line long. Outer glume less than half the length of the spikelet, 3-nerved, acute; 2nd and 3rd glumes nearly equal, acute or acuminate, 5-nerved. A male flower in the 3rd glume. Fruiting glume rather acute, smooth or very minutely rugose.

N. Australia. Escape Cliffs, *Hulse;* Port Darwin, *Schultz, n.* 806.

P. maximum, Linn., known under the name of *Guinea Grass,* has been sent from Brisbane as an escape from cultivation. It is an erect grass of 3 to 5 ft., with long and rather broad leaves. Panicle large and loose, with numerous capillary much divided branches. Spikelets numerous, all pedicellate, 1¼ to 1½ lines long, obtuse. Glumes membranous and obtuse, the outer one about ¼ the 2nd and 3rd. A male flower in the 3rd. Fruiting glume acute, slightly rugose.

41. **P. pygmæum,** *R. Br. Prod.* 191.—A small species, creeping and rooting at the nodes, ascending to about 6 in. Leaves rarely above 1 in. long, linear or lanceolate, ciliate and usually but not always sprinkled with long hairs. Panicle short and spreading, with a few capillary flexuose simple or slightly divided branches. Spikelets few

and distant, scarcely 1 line long, obtuse, glabrous. Outer glume very short, broad, truncate, nerveless; 2nd and 3rd glumes equal, 3- or 5-nerved, both empty. Fruiting glume smooth and shining.—F. Muell. Fragm. viii. 193.

Queensland. Brisbane River, Moreton Bay, *F. Mueller*, *Bailey*; Cleveland Bay, *Gulliver*; South Queensland, *Hartmann*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Mrs. Calvert* and others; Ash Island, *Scott*.

42. **P. trichoides,** *Sw.*; *Kunth, Enum.* i. 112.—Decumbent at the base and often shortly creeping and rooting, though sometimes apparently annual, the stems slender, ascending to from 6 in. to nearly 1 ft. Leaves ovate-lanceolate or rarely narrow, cordate and ciliate at the base, the sheaths also often slightly hairy. Panicle at first sessile within the last leaf, but at length pedunculate, decompound with numerous capillary flexuose divided spreading branches, the lower ones clustered, the whole panicle ovate in outline 2 to 4 in. long, and often almost as broad, glabrous, or with a few long hairs scattered on the main rhachis. Spikelets almost the smallest in the genus, ovoid, obtuse, scarcely more than ½ line long. Outer glume scarcely ½ the length of the spikelet, ovate, acute, 1-nerved; 2nd and 3rd nearly equal, broadly ovate, 3-nerved, shortly hirsute; a small palea sometimes but not always in the 3rd. Fruiting glume smooth and shining.

N. Australia. Port Darwin, *Schultz*, *n.* 264.

Queensland. Daintree River, *Fitzalan*.

P. minutum, R. Br. Prod. 191, from Endeavour River, *Banks and Solander*, is founded upon a very small slender annual of 2 or 3 in. including the panicle, which appears to be an accidentally small depauperated state of *P. trichoides*.

43. **P. hermaphroditum,** *Steud. Syn. Glum.* i. 67.—Stems creeping and rooting at the base, ascending to 1 ft. or more, rather slender. Leaves spreading, lanceolate or almost linear, sprinkled especially the lower ones with rather long hairs. Panicle narrow, rather dense, 1½ to 3 in. long, the short capillary branches much divided, with few or many long hairs on the rhachis and branches. Spikelets very numerous, all pedicellate, usually of a dark brown, obliquely ovoid, under ¼ line long and broad. Empty glumes all broad and 3-nerved, the outer one more than ½ the length of the spikelets, the 2nd very broad and gibbous, the 3rd rather longer and straight. Fruiting glume very hard and smooth, broad and very gibbous. Palea also hard and smooth, projecting laterally from the glume more than in any other species.—*P. pilipes*, Nees in Pl. Wight, Exs. n. 2343.

Queensland. Daintree River, *Fitzalan*.

This species, which is also in Ceylon, the East Indian Peninsula and the Malayan Archipelago, appears to me to be quite distinct from the *P. trigonum*, Retz, with which it is united in Thw. Enum. 359.

44. **P. marginatum,** *R. Br. Prod.* 190.—A rather slender but often rigid grass, decumbent branching and often rooting at the base,

ascending to 1 ft. or more, glabrous except the cilia at the orifice of the sheaths, and the rhachis of the inflorescence often slightly pubescent. Leaves flat, usually narrow, but exceedingly variable in size. Panicle narrow, in the typical form 1½ to 3 in. long, of few erect or scarcely spreading simple or slightly divided branches. Spikelets irregularly crowded along the branches or sometimes almost in a single row, ovoid, obtuse or scarcely acute, about 1½ lines long. Outer glume very thin, not ⅓ the length of the spikelet, 1-nerved or faintly 3-nerved; 2nd and 3rd glumes nearly equal and similar, both empty, membranous, 3- or 5-nerved, glabrous. Fruiting glume rather shorter, slightly hardened and densely silky-pubescent or villous as well as the exposed part of the palea.—Trin. Spec. Gram. ii. t. 209; F. Muell. Fragm. viii. 190; Sieb. Agrostoth. n. 69.

Queensland. Wide and Moreton Bays, *F. Mueller*, *Leichhardt* and others; Rockhampton, *O'Shanesy.*

N. S. Wales. Port Jackson, *R. Brown* and others; Hunter's River, *R. Brown;* New England, *C. Stuart;* Macleay River, *Beckler;* Hastings River, *C. Moore.*

Victoria. Various localities in eastern Gipps' Land, *F. Mueller.*

Var. *majus.* Stems tall, with broad leaves 6 in. long, the lower branches of the panicle 3 or 4 in. and the spikelets above 1½ lines long.—Queensland, chiefly in *Leichhardt's* collections.

Var. *strictum.* Stems slender, rigid, much branched, with very short narrow leaves, the panicle narrow, very little branched, and sometimes reduced to a simple interrupted spike.—*P. strictum*, R. Br. Prod. 190; Trin. Spec. Gram. ii. t. 179; Sieb. Agrostoth. n. 71 and 90.—Port Jackson, *R. Brown* and others.

Amidst all its varieties which it sometimes seems difficult to unite, this species is readily known by the dense pubescence of the fruiting glume which has not been observed in any other *Panicum.* Some specimens seem to show that the *P. strictum* is rather an after-growth from plants that have been cut down, than a distinct variety. The *P. singulare*, Steud. Syn. Glum. i. 60, from the character given, must be referrible to the same species.

45. **P. lachnophyllum,** *Benth.*—A low decumbent grass, with ascending branches of 6 to 8 in. Leaves very spreading, rather rigid, acute, softly pubescent on both sides, the sheaths softly villous, the ligula reduced to cilia. Panicle narrow, erect, not much branched, 1 to 2 in. long. Spikelets very shortly pedicellate or almost sessile, ovoid, obtuse, rather under 1 line long. Outer glume small, ovate, rather acute, 2nd and 3rd glumes nearly equal, membranous, 5-nerved, both empty. Fruiting glume smooth and shining, but tipped with a slight pubescence.

Queensland. Moreton Bay, *C. Stuart.* F. Mueller thinks that this may be a variety of *P. marginatum*, but besides a difference in habit and the pubescence of the leaves, the spikelets are much smaller and the fruiting glumes quite glabrous except at the tip.

46. **P. obseptum,** *Trin. Gram. Panic. Diss.* ii. 149.—A weak glabrous grass, decumbent at the base or creeping in the mud and shortly ascending. Leaves narrow, the ligula a ring of cilia. Panicle narrow and loose, 1 to 2 in. long, of few simple or scarcely divided

branches. Spikelets few, all pedicellate, the upper ones of each primary branch solitary, the lower ones 2 or 3 together on short secondary branches, all narrow-ovoid, 1 to 1½ lines long, quite glabrous, rather obtuse. Outer glume short, broad, nerveless, truncate or shortly acute, the 2nd and 3rd equal or nearly so, membranous, 5-nerved, both empty. Fruiting glume rather acute, smooth and shining.

N. S. Wales. Borders of ponds, Port Jackson and Richmond, *Woolls;* New England, *C. Stuart.*

The shape of the spikelets and glumes would suggest that this might be a very reduced form of *P. decompositum*, but none of the rather numerous specimens show any tendency to a further development and there is no vestige of a palea in the 3rd glume. It is doubtfully referred by F. Mueller, Fragm. viii. 195, to *P. hygrocharis*, Steud., an Abyssinian plant named *P. paludosum* by Hochstetter and published as *P. aquaticum* by A. Richard, but that is the common *P. repens*, readily known amongst other characters by the male flower in the 3rd glume. I have not seen the typical specimen received by Trinius from Lindley as from Port Jackson, but the description given by Trinius, as well as that of Nees in Mart. Fl. Bras. ii. 113, taken from the same specimen, leave no doubt as to its identity.

47. **P. Buncei,** *F. Muell. Herb.*—A glabrous perennial of 1 to 2 ft. Leaves long and narrow, the ligula prominent, bordered by a few long cilia. Panicle narrow, rather loose, not much branched, 3 to 4 in. long, the branches filiform and flexuose. Spikelets several along the smaller branches, rather acute, nearly 2 lines long. Outer glume broad and loose, thin, almost truncate but 1- or 3-nerved, ¼ or ⅓ the length of the spikelet; 2nd and 3rd glumes nearly equal, membranous, 5- or 7-nerved, glabrous, the 3rd rather longer than the 2nd, with a broad acuminate rather rigid palea, but no stamens in any of the spikelets examined. Fruiting glume obtuse, about ⅔ the length of the outer ones, smooth and shining.

Queensland. Bokhara Flats, *Leichhardt.*—I have some hesitation in proposing this species, which has much the aspect of a few specimens of *P. repens*, but there appears to be no male flower in the 3rd glume which I have invariably found in *P. repens.*

48. **P. bicolor,** *R. Br. Prod.* 191.—Usually a small slender tufted grass, with much the habit of some species of *Aira* or *Agrostis*, but sometimes above 1 ft. high, approaching in habit the *P. melananthum.* Leaves linear, usually very narrow, more or less hairy especially at the orifice of the sheath, rarely quite glabrous, the ligula very short, ciliate. Panicle usually only 2 or 3 in. long, loose and slender but rather narrow, but sometimes larger and spreading, the branches capillary and flexuose, not clustered and not much divided. Spikelets all pedicellate, about 1 line long, glabrous. Outer glume acute, 3-nerved, fully ½ as long as the spikelet; 2nd and 3rd glumes nearly equal, acute, about 5-nerved, the 3rd with a palea but no stamens. Fruiting glume smooth and shining.

Queensland. Brisbane River, Moreton Bay, *F. Mueller*, *Bailey;* Rockhampton, *O'Shanesy;* Herbert's Creek, *Bowman.*

N. S. Wales. Port Jackson, *R. Brown, Woolls;* Maneroo, *Mrs. Calvert;* New England, *C. Stuart;* Archer's Station, *Leichhardt.*

49. **P. melananthum,** *F. Muell. in Trans. Vict. Inst.* 1855, 47.—A glabrous grass of 2 ft. or more, decumbent at the base and perhaps annual. Leaves flat and rather broad, the ligula exceedingly short, ciliate. Panicle sessile or nearly so within the last leaf, large and loose, with very numerous much divided capillary branches, scattered along the main rhachis and very rarely clustered. Spikelets all pedicellate, about 1 line long, acute, glabrous, often dark-coloured. Outer glume ovate, acute, 1- or sometimes 3-nerved, nearly ½ the length of the spikelet; 2nd and 3rd glumes nearly equal, acute, rather broad, membranous, with usually 5 not prominent nerves, the 3rd quite empty without any palea. Fruiting glume smooth and shining.

Queensland. Brisbane River, Moreton Bay, *F. Mueller, Bailey.*
N. S. Wales. New England, *C. Stuart;* Clarence River, *Wilcox.*
Victoria. Hume, King and Ovens Rivers, *F. Mueller.*

F. Mueller (Fragm. viii. 192) refers this to *P. coloratum* Linn., a species founded on a garden plant which is apparently not distinct from *P. repens.*

P. miliaceum, Linn., a species very much cultivated in the Mediterranean region under the name of 'Little Millet' as well as in several hot countries, has been found in South Australia as an escape from cultivation (*F. Mueller*). It is an erect annual of about 2 ft., with rather broad hairy leaves and a much divided nodding panicle. Spikelets numerous, pedicellate, ovoid, about 2 lines long, the outer glume acute, 3-nerved, above half as long as the broad membranous 7- to 11-nerved 2nd and 3rd glumes. Fruiting glume smooth and shining.

50. **P. effusum,** *R. Br. Prod.* 191.—An erect perennial, our specimens mostly under 1 ft. but said to attain 2 ft. Leaves lanceolate or linear-lanceolate, scabrous and hairy as well as the sheaths, the nodes bearded with long spreading hairs; ligula very short and ciliate. Panicle much-branched, sessile within the last leaf, 3 to 4 in. long when first in flower, at length twice as long, the filiform divided branches very spreading and flexuose, the lower ones densely clustered but not verticillate, the upper ones scattered and distant. Spikelets all pedicellate, acute, about 1 line long, glabrous. Outer glume acute, 1- to 3-nerved, about ½ the length of the spikelet or rather more; 2nd and 3rd glumes nearly equal, 5- or 7-nerved, a palea within the 3rd about ½ its length. Fruiting glume smooth and shining.—Sieb. Agrostoth. n. 67; Trin. Spec. Gram. t. 244.

Queensland. Rockhampton, *Bowman;* and apparently the same, Cape York, *Daemel.*
N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Woolls* and others; northward to New England, *C. Stuart;* Macleay River, *Beckler;* and in the interior Nanduruga Creek, *Victorian Expedition.*

Var. *convallium,* less hairy and more or less glaucous.—*P. convallium;* F. Muell. in Trans. Vict. Inst. 1855, 46.

N. S. Wales. Murray and Darling Rivers, *F. Mueller, Dallachy.*
Victoria. Ballarat, *Bacchus;* Portland Bay, *F. Mueller.*

S. Australia. Gawler Town, Flinders Range, Torrens River, etc., *F. Mueller;* North of Fowler's Bay, *Giles.*
W. Australia. Fraser's Range, *Dempster.*

F. Mueller (Fragm. viii. 191) refers the whole species to the North American *P. capillare*, Gronov., to which it certainly bears some general resemblance, but that species has as far as is known always a male flower in the 3rd glume, which I have never found in the Australian *P. effusum*, besides other minor differences.

51. **P. Mitchelli,** *Benth.*—An erect grass, decumbent at the base only, 2 to 3 ft. high, nearly allied to *P. effusum*, but larger, quite glabrous and the nodes not bearded. Leaves often long, the short ligula rather jagged than ciliate. Panicle usually very large and spreading with very numerous divided filiform branches, the lower ones clustered and rigid, the upper ones scattered. Spikelets all pedicellate, usually several along the ultimate branches, rather above 1 line long, acutely acuminate, quite glabrous. Outer glume acute, nearly ½ the length of the spikelet, 1- to 3-nerved; 2nd and 3rd glumes nearly equal, acutely acuminate, about 5-nerved, a palea in the 3rd sometimes very small, more frequently above ½ the glume. Fruiting glume smooth and shining.

Queensland. North-east Coast, *A. Cunningham;* Cape York, *Daemel*; Port Curtis, *M'Gillivray*; Rockingham Bay, *Dallachy;* Rockhampton, *O'Shanesy;* Warwick, *Beckler.*
N. S. Wales. Bogan River, *Mitchell;* county Campden, Macquarrie and Castlereagh Rivers, *Woolls;* Clarence River, *Beckler.*

A smaller glaucous plant with a smaller panicle and rather larger spikelets, from Cooper's Creek, *Howitt's Expedition*, appears to be a variety of this species.

F. Mueller, Fragm. x. 76, mentions *P. incomptum*, Trin., as having been gathered by Dallachy at Rockingham Bay. I have not found among Dallachy's plants in Herb. F. Muell. any specimens answering to those we have of *P. incomptum* from the Philippine Islands as well as from E. India, nor any so named by F. Mueller, but it is possible he may have intended to include in *P. incomptum* Dallachy's specimens of *P. Mitchelli*, which are allied to it but according to my views quite distinct.

52. **P. decompositum,** *R. Br. Prod.* 191.—A semi-aquatic glabrous grass, often tall and stout. Leaves mostly long, flat and rather broad especially when growing in water, narrow in drier situations; ligula very short and broad, ciliate. Panicle 6 in. to 1 ft. long or even more, with numerous crowded filiform divided branches, the lower ones clustered, at first erect and enclosed at the base within the last leaf-sheath, at length sometimes very loose and spreading to the breadth of 1 ft. Spikelets all on slender pedicels, narrow, acute, 1¼ to 1½ lines long, usually of a pale straw colour. Outer glume very short, broad and truncate, thin and nerveless; 2nd and 3rd glumes nearly equal, acute, thinly membranous, 5- or 7-nerved, the 3rd with a palea from ¼ to ½ its length but no stamens. Fruiting glume very smooth and shining.—*P. proliferum*, F. Muell. Fragm. viii. 191, not of Lam.; *P. amabile*, Balansa in Bull. Soc. Bot. Fr. xix. 324, at least as to the W. Australian plant referred to; *P. lævinode*, Lindl. in Mitch. Three Exped. i. 238.

N. Australia. Gulf of Carpentaria, *R. Brown;* Victoria and Fitzmaurice Rivers, *F. Mueller;* Cygnet Bay, *A. Cunningham.*

Queensland. Port Curtis, *M'Gillivray*; Brisbane River, *Bailey;* Flinders River, *Sutherland*; King's Creek, *Bowman*; Peak Downs. *Burkitt*; also in *Leichhardt's* collection.

N. S. Wales. Macleay River, *Beckler*; Russell and Johnston Rivers, *W. Hill*; Darling River, *Mitchell.*

S. or **Central Australia.** Cooper's Creek, *Howitt*; near Lake Eyre, *Andrews*; Charlotte Waters, *Giles.*

W. Australia, *Drummond, n.* 43 and 957; Murchison River, *Oldfield.*

The species is also common in East India if the *P. paludosum*, Roxb. be really identical, as it appears to be notwithstanding some slight differences in the specimens examined. Some of the narrower-leaved Australian specimens differ also in the rather smaller spikelets with the outer glume not quite so truncate, but all are probably one species. Munro is also of opinion that the North American *P. geniculatum*, Muehl. may be the same, but certainly not the *P. proliferum*, Lam., to which *P. paludosum*, Roxb. has been inadvertently referred by some recent botanists.

53. **P. trachyrhachis,** *Benth.*—A tall erect stout glabrous plant, nearly allied to *P. decompositum.* Leaves long and narrow, the ligula reduced to a ring of cilia, the nodes glabrous. Panicle large and loose, often 1 to 1½ ft. long, with numerous long slender divided branches, the lower ones usually verticillate, scabrous as well as the rhachis. Spikelets all pedicellate, nearly 1¼ lines long. Outer glume often as long as the others, 3- or 5-nerved, tapering into a long point sometimes ciliate at the end; 2nd and 3rd glumes nearly equal, acutely acuminate, 7- or 9-nerved, the 3rd with a palea often nearly as long, but no stamens in any of the specimens examined. Fruiting glume much shorter, obtuse, smooth and shining.

N. Australia. Victoria River, *Elsey;* Port Darwin, *Schultz, n.* 343; Arnhem's Land, *M'Kinlay.*

Var. *tenuior.* More slender, panicle not so large and less scabrous, and the glumes less acute.

Queensland. Percy Islands, *A. Cunningham;* Brisbane River, *Bailey;* Peak Downs, *F. Mueller;* Springsure, *Wuth.*

F. Mueller, Fragm. viii. 192, reduces the species to the North American P. *virgatum*, Linn., which it resembles in some respects, but differs in inflorescence, and the American plant is always described as having a male flower in the 3rd glume, which I also find in all the American specimens I have examined.

54. **P. prolutum,** *F. Muell. in Trans. Vict. Inst.* 1855, 46.—Stems from a branching base erect, rigid, 1 to 2 ft. high. Leaves rather rigid, the margins involute when dry, glabrous and glaucous; ligula very prominent, scarious, truncate or slightly jagged. Panicle 3 to 6 in. long, of numerous slender divided branches, the lower ones clustered, erect and enclosed at the base by the last sheath or at length exserted and spreading. Spikelets on filiform pedicels ovoid, acute, glabrous, about 1½ lines long. Empty glumes rather rigid, prominently nerved, the outer one obtuse, with scarious margins, more than ½ the length of the spikelet, 3- or 5-nerved, the 2nd and 3rd nearly equal, acute,

5- or 7-nerved, no palea in the 3rd. Fruiting glume smooth and shining.

Queensland. Condamine River, *Hartmann ;* Armadillo, *Barton.*
N. S. Wales. Lachlan and Darling Rivers, *Dallachy*, *Burkitt ;* Mount Murchison, *Bonny.*
Victoria. Avoca Murrumbidgee and Light Rivers, *F. Mueller.*
S. Australia. Flinders Range, *F. Mueller.*

Munro thinks that the Queensland plant may prove to be distinct from the more southern one. The two, however, must be closely allied and readily distinguished from all others of the group by the much longer ligula not ciliate.

4. OPLISMENUS, Beauv.

(Orthopogon, *R. Br.*)

Spikelets with 1 terminal hermaphrodite flower and a rudimentary one below it, awned, clustered along the secund distant branches of a simple panicle. Glumes 4, the lowest empty one not much shorter than the others and with a longer awn, the flowering glume awnless and hardened with the palea round the grain as in *Panicum.*

A small tropical and subtropical genus common to the New and the Old World, and very closely allied to some of the awned species of *Panicum*, to which several botanists would restore it. The inflorescence, together with the greater development and long awn of the outer empty glume, may however suffice to retain it as distinct, with the limits originally assigned to it by Beauvois and by Brown. The Australian species are both of them of a very wide distribution.

Lower branches of the panicle ½ to 2 in. long	1. *O. compositus.*
All the branches of the panicle reduced to sessile clusters . .	2. *O. setarius.*

1. **O. compositus,** *Beauv. Agrostogr.* 54.—Usually a weak grass softly pubescent or villous, but sometimes nearly glabrous. Stems decumbent or creeping and rooting at the base, ascending sometimes to above 1 ft. Leaves from linear-lanceolate to ovate-lanceolate, 4 to 5 in. long in the larger specimens, but more frequently under 2 in. Panicle slender, consisting of 4 to 8 or rarely more distant one-sided branches or spikes, of which the lowest slender ones are 2 in. long in the most luxuriant specimens, scarcely ½ in. long in others, the upper ones or sometimes the greater number reduced to short clusters. Spikelets glabrous pubescent or hirsute, rather above 1 line long, in distinct clusters of 2 or 3 each along the longer branches, crowded on the shorter ones. Glumes 3 lower ones membranous, 5-nerved, the lowest not much shorter than the others tapering into a rather long smooth awn, the 2nd with a small point or short awn, or only acuminate, the 3rd rather larger, awnless, with a small hyaline palea or rudimentary flower in its axil; flowering glume nerveless, smooth and hard as well as the palea round the grain.—*Panicum compositum*, Linn.; Trin. Spec. Gram. ii. t. 187, 188, 190; F. Muell. Fragm. viii. 199; *Orthopogon compositus*, R. Br. Prod. 194.

Queensland. Shoalwater Bay and Broad Sound, *R. Brown;* Cape York, *Daemel;* Endeavour River, *A. Cunningham;* Goold and Dunk Islands, *McGillivray;* Rockingham Bay, *Dallachy.*

N. S. Wales. *Sieber, Agrost. n.* 73; Botany Bay, *Banks and Solander;* Blue Mountains, *Woolls;* Macleay and Clarence Rivers, *Beckler.*

2. **O setarius,** *Rœm. and Schult.; Kunth, Enum.* i. 139.—Very near the slender forms of *O. compositus*, and perhaps rightly included in that species by F. Mueller, but the spikes or branches of the panicle are all reduced to single sessile clusters of spikelets, or the lowest rarely slightly elongated into 2 distinct clusters. Leaves always narrow-lanceolate.—*Panicum setarium,* Lam. Illust. i. 170.

Queensland. Keppel Bay, *R. Brown;* Moreton Bay, *C. Stuart.*

N. S. Wales. Hunter's River, *R. Brown;* Tweed River, *C Moore, Guilfoyle;* Archer's Creek, *Leichhardt;* Lord Howe's Island, *Fullagar.*

Victoria. Snowy and Broadribb Rivers, *F. Mueller;* Yarra River, *Luckman.*

There are two varieties sometimes distinguished as species; the one softly villous, including the Moreton Bay and Tweed River specimens, is the *Orthopogon æmulus,* Br. Prod. 194 (*Oplismenus æmulus,* Kunth, Enum. i. 142); the other, glabrous or nearly so, comprising the remaining specimens above quoted, includes *Orthopogon flaccidus* and *O. imbecillis,* R. Br. Prod. 194 (*Oplismenus flaccidus,* and *O. imbecillis,* Kunth, Enum. i. 142; *Panicum imbecille,* Trin. Spec. Gram. t. 191).

5. SETARIA, Beauv.

Spikelets with 1 terminal hermaphrodite flower and sometimes a second male one below it, crowded in a cylindrical dense or rarely interrupted spikelike panicle, not awned but surrounded by numerous awnlike barren branches, persistent on the main rhachis, the spikelets sessile near the base of the branches and falling away from them. Glumes 4, the outer one small, the 2nd usually shorter than the 3rd. A palea and sometimes 3 stamens in the axil of the 3rd. Terminal or fruiting glume of a firmer consistence, with a perfect flower. Styles distinct. Grain enclosed in the hardened glume and palea, but free from them.

The genus is generally spread over the warmer and temperate regions of the globe. Of the four Australian species three are common weeds over nearly the whole area, the fourth is abundant in America, more rare especially in the typical form in Asia. The genus is by some again reduced to a section of *Panicum* with which it is connected chiefly through the Asiatic *P. enode* and *P. plicatum.*

Fruiting glume transversely rugose. Awnlike panicle-branches scabrous, with erect teeth.
  Panicle cylindrical, simple, 1 to 1½ in. long, the spikelets solitary at the base of the awnlike branches . . . 1. *S. glauca.*
  Panicle dense or interrupted, 3 to 8 in. long, the spikelets clustered near the base of the awnlike branches 2. *S. macrostachya.*
Fruiting glume smooth. Spikelets more or less clustered.
  Awnlike panicle-branches scabrous with erect teeth . . 3. *S. viridis.*
  Awnlike panicle-branches scabrous with reversed teeth 4. *S. verticillata*

1. **S. glauca,** *Beauv.; Kunth, Enum.* i. 149.—An erect annual, of a pale green, 1 to 2 ft. high. Leaves flat, with scabrous edges and

often ciliate with a few long hairs. Spikelike panicle simple, cylindrical, 1 to 1½ in. long, the spikelets solitary at the base of numerous awnlike branches, many of which are barren and all scabrous with minute teeth directed upwards. Spikelets ovoid, about 1½ lines long. Outer glume very small, the 2nd not quite so long as the 3rd. A palea and very rarely stamens in the 3rd. Fruiting glume more or less gibbous, marked with prominent transverse wrinkles.—Reichb. Ic. Fl. Germ. t. 47; *Panicum glaucum*, Linn.; Trin. Spec. Gram. t. 195; *ennisetum glaucum*, R. Br. Prod. 195; F. Muell. Fragm. viii. 110.

N. Australia and **Queensland**, *R. Brown*, and sent by various collectors from numerous localities.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and others; and in the interior, *A. Cunningham* and others.

Victoria. Goulburn River, *F. Mueller.*

Central Australia, *Gosse.*

A common weed in the Old World and some parts of America, said by Döll and others to be replaced in Brazil by the *S. imberbis*, R. and S. which, however it seems difficult to distinguish specifically in America any more than in the Old World.

2. **S. macrostachya,** *H. B.* and *K. Nov. Gen. et Sp.* i. 110.—Much taller and stouter than *S. glauca.* Leaves long, flat, often above ½ in. broad, the ligula short, ciliate, otherwise quite glabrous in the typical form. Spikelike panicle 3 to 8 in. long, compound, usually very compact and cylindrical or the lower branches longer. Spikelets numerous on the lower branches, few on the upper ones, in dense clusters more or less interspersed with awnlike barren branches, ovoid, acute, fully 1½ lines long, glabrous. Outer glume about ½ the length of the spikelet, the 2nd shorter than the 3rd but variable in proportion, all membranous with prominent nerves. Fruiting glume often oblique or gibbous, always marked with prominent transverse wrinkles as in *S. glauca.*—*Panicum macrostachyum*, Nees; *Pennisetum italicum*, R. Br. Prod. 195; F. Muell. Fragm. viii. 110, but not the *Panicum italicum*, Linn.

Queensland. Endeavour River, *Banks and Solander;* Port Denison, *Fitzalan;* Herbert's Creek, *Bowman;* Rockhampton, *O'Shanesy;* Brisbane and Gilbert Rivers, *F. Mueller*, and other localities in south Queensland from various collectors.

N. S. Wales. Clarence River, *Wilcox.*

The species is common in many parts of tropical America in a form corresponding to the usual Australian one; from East India we have but few specimens of a more slender variety with interrupted spikelike panicles. The West Indian *S. setosa*, Rœm. and Schult., or *Panicum setosum*, Sw. Trin. Spec. Gram. t. 95, 96, has been also referred to it, although it has generally a looser and narrower panicle. The *S. italica*, so much cultivated in some parts of Asia and of the Mediterranean region, is a very different species, readily known by its small nearly globular spikelets with smooth fruiting glumes.

Var.? *Schultzii.* Stems more slender. Leaves sprinkled with rigid hairs. Panicle long, narrow, slender and interrupted.—*Pennisetum Swartzii*, F. Muell. Fragm. viii. 110.

N. Australia Port Darwin, *Schultz*, n. 272. With the habit nearly of the typical *S. setosa*, this may prove to be a distinct species.

3. **S. viridis,** *Beauv.; Kunth, Enum.* i. 151.—An annual with the habit of the *S. glauca*, but the spikelike panicle looser, 1 to 2 in. long in the typical form, but occasionally nearly twice that, the lower spikelets in distinct clusters or on short branches, the awnlike branches more irregular and often shorter, the asperities directed upwards as in *S. glauca*. Outer glume acute, about ½ the length of the spikelet; 2nd and 3rd glumes nearly equal, broad, concave, 5- or 7-nerved. Fruiting glumes smooth and shining, the minute transverse wrinkles visible only under a lens.—Reichb. Ic. Fl. Germ. t. 47; *Panicum viride,* Linn.; Trin. Spec. Gram. t. 203; *Pennisetum viride,* R. Br. Prod. 195.

N. Australia. Dampier's Archipelago, *A. Cunningham* (an exceptional form with spikes 3 to 4 in. long).
Central Australia. McDonnel Range, *Giles*.
W. Australia, *Drummond*.

Widely spread as a weed in many parts of the Old World, but not so common as *S. glauca* and *S. verticillata*.

4. **S. verticillata,** *Beauv.; Kunth, Enum.* i. 152.—An annual with the habit of *S. glauca* and *S. viridis*. Spikelike panicle 1 to 3 in. long, often rather loose and interrupted at the base, the spikelets densely clustered at the base of the branches, and the awnlike barren branches very adhesive, with the asperities or teeth directed downwards, not upwards as in other *Setariæ*. Spikelets scarcely above 1 line long. Outer glume about ½ the length of the spikelet; 2nd glume nearly as long as the 3rd, broad, about 7-nerved. Fruiting glume smooth and shining, the minute transverse wrinkles visible only under a lens.—Reichb. Ic. Fl. Germ. t. 47; *Panicum verticillatum,* Linn.; Trin. Spec. Gram. t. 202; *Pennisetum verticillatum,* R. Br. Prod. 195; F. Muell. Fragm. viii. 110.

N. Australia. Dampier's Archipelago and Nichol Bay, *Walcot*.
W. Australia, *Drummond*.

A common weed of cultivation in warm and temperate countries, in many places probably of modern introduction.

6. PLAGIOSETUM, Benth.

Spikelets 1-flowered, usually solitary between the barren branches of partial panicles or involucres, not awned, the involucres few and distant along the rhachis of a simple panicle and falling off with the spikelets, the branches few with unilateral bristle-like branchlets, rarely bearing a second spikelet. Glumes 4, the outer one short, the 2nd and 3rd empty. Styles distinct. Nut enclosed in the hardened fruiting glume and palea.

The genus is limited to a single species, endemic in Australia, allied to *Setaria* and *Pennisetum*, but with the involucre very different from either.

1. **P. refractum,** *Benth. in Hook. Ic. Pl. t.* 1242—Apparently an-

nual, much branched, 6 in. to 1ft. high, glabrous, leafy in the lower part, the leaves narrow. Involucres few, distant along a simple terminal leafless rhachis, all pedunculate, the peduncles spreading or reflexed, 3 to 5 lines long, articulate at the base and falling off with the involucre and spikelet. Involucre not completely surrounding the spikelet, about ½ in. long, the bristles not plumose, united at the base into 3 or 4 slightly flattened branches with the minor branches or bristles along their inner face, the main branch continuing the peduncle. Spikelet usually solitary on a short thick pedicel between the branches, narrow, somewhat acuminate, about 3 lines long. Outer glume ½ the length of the spikelet or rather more; 2nd and 3rd glumes both empty equal and many-nerved. Fruiting glume hard, apparently smooth and shining but minutely rugose under a lens.—*Setaria refracta*, F. Muell. Fragm. iii. 147; *Pennisetum refractum*, F. Muell. Fragm. viii. 109.

Central Australia. Cooper's Creek, *Howitt's Expedition;* Alice Springs, *Giles*. Occasionally but rarely the principal branch of the involucre is rather more flattened and ends in a second spikelet, but the articulation is below the involucre as in *Pennisetum*, not under each spikelet as in *Setaria*.

7. PENNISETUM, Rich.

(Gymnothrix, *Beauv*).

Spikelets 1-flowered, solitary or 2 or 3 together, sessile or nearly so, each one enclosed in an involucre of several usually numerous simple or plumose bristles (probably awnlike branches of the panicle), the involucres crowded in a spike or spikelike simple panicle, falling off from the main rhachis with the spikelet and short peduncle. Glumes 4, the outer one shorter or sometimes minute, the 2nd and 3rd both empty. Fruiting glume usually smaller. Palea perfect. Styles distinct or united almost to the plumose stigmas. Nut enclosed in the more or less hardened glume and palea, free from it.

The genus is spread over the tropical regions of the Old World with a few American species. Of the two Australian species, one is very close to if not identical with a Chinese and Japanese one, the other is endemic. They would, according to the views of some modern botanists, be placed in two different genera, founded on the nature of the involucre, and neither belong to the typical form with the inner bristles plumose and the outer ones simple.

Involucral bristles numerous, all simple, surrounding the spikelet in several rows . . . . 1. *P. compressum*.
Involucral bristles 6 to 10, all plumose at the base, closely surrounding the spikelet . . . . 2. *P. arnhemicum*.

1. **P. compressum,** *R. Br. Prod.* 195.—Stems 2 to 3 ft. high, erect, usually very scabrous and more or less hirsute under the panicle, glabrous and smooth lower down. Leaves long and narrow, glabrous, the ligula prominent. Involucres nearly sessile in a simple cylindrical dense spike of 3 to 6 in., consisting of numerous very unequal bristles, the inner more rigid ones varying from ½ to 1 in., the outer ones much shorter and finer, mostly minutely scabrous-ciliate but none of them

plumose. Spikelet solitary within the involucre, narrow, terete, rather acute, about 3 lines long. Outer glume under ½ line long, orbicular, 2nd glume from ⅓ to ½ the length of the spikelet, the 3rd many-nerved, empty. Fruiting glume scarcely more rigid than the 3rd. Styles united up to the feathery branches.—F. Muell. Fragm. viii. 110; *Setaria compressa*, Kunth, Enum. i. 150; *Gymnothrix compressa*, Brongn. in Duperr. Voy. Bot. 103, t. 9.

Queensland. Brisbane River, Moreton Bay, *F. Mueller; Leichhardt* and others; Rockhampton and neighbourhood district, *Thozet* and others.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *A. Cunningham*, *Woolls* and others; New England, *C. Stuart;* Richmond River, *Mrs. Hodgkinson.*

P. japonicum, Trin. Spec. Gram. t. 19 (*Gymnothrix japonica*, Kunth, Enum. i. 158)· from China, Japan, and perhaps from Burmah, is closely allied to if not identical with *P. compressum*, although the outer glumes are generally longer in proportion, and the whole spike usually but not always larger.

2. **P. arnhemicum,** *F. Muell. Fragm.* viii. 109.—Stems erect. Leaves narrow, rather rigid, glabrous and glaucous, the ligula very short, split into cilia. Spike rather dense, about 4 in. long. appearing woolly from the plumose bristles. Involucres almost sessile, of 6 to 10 unequal bristles, the longest about ½ in. long, all very densely woolly-plumose with long soft white hairs. Spikelet solitary, shortly pedicellate within the involucre, about 2 lines long, quite concealed in the wool. Outer glume about ⅓ the length of the spikelet, 2nd and 3rd glumes nearly equal, both empty and about 7-nerved, Fruiting glume shorter, hard, smooth and shining. Styles separate to the base or nearly so.

N. Australia. Upper Victoria River, *F. Mueller.* Allied to the African *P. lanuginosum*, Hochst., but the bristles more numerous, rigid and longer, and the spikelets rather longer.

8. CENCHRUS, Linn.

Spikelets with 1 terminal hermaphrodite flower and sometimes a male one below it, not awned, singly or 2 or 3 together within an ovoid or globular involucre of numerous bristles, the inner ones usually broad and flattened, connected at the base and hardened round the fruit, the involucres sessile or pedicellate in a simple spike or raceme and falling off with the spikelets. Glumes 4, the outer one much smaller, sometimes minute, the 2nd and 3rd nearly equal or the 2nd shorter; a palea and sometimes 3 stamens in the 3rd. Fruiting glume more rigid than the others but not so much hardened as in *Panicum*. Styles usually very shortly united at the base. Nut enclosed in the fruiting glume and palea, free from them.

The genus is spread over the warmer regions of both the New and the Old World. The Australian species are all endemic, although one of them differs but very little from a New Caledonian and Polynesian one.

Leaves glabrous. Involucres under 4 lines long, the inner bristles or lobes plumose at the base. Spikelets solitary . . . . 1. *C. australis.*
Leaves glabrous. Involucre under 4 lines long, the inner bristles or lobes lanceolate, not ciliate, inflexed when in fruit . . . . 2. *C. inflexus.*
Leaves softly villous. Involucres 5 lines long, the inner bristles or lobes shortly ciliate. Spikelets usually 3 . 3. *C. elymoides.*

1. **C. australis,** *R. Br. Prod.* 196.—A stout glabrous grass, attaining 6 to 9 ft. Leaves long and flat; ligula split into cilia. Spike rather dense, 4 to 8 in. long, the rhachis slightly scabrous-pubescent. Involucres very shortly pedicellate, erect or at length reflexed, broadly ovoid, under 4 lines long, the inner bristles or lobes about 10, flattened and very shortly united at the base, plumose in the lower half, scabrous in the upper part with reversed asperities, one sometimes but not frequently longer than the others; outer bristles numerous, unequal, subulate and scabrous from the base. Spikelets (always?) solitary in the involucre and shorter than the inner lobes. Outer glume short, obtuse, hyaline, nerveless, 2nd glume acute, 3- or 5-nerved, 3rd rather longer, 5-nerved, with a palea and sometimes a male flower in its axil. Fruiting glume as long.—Sieb. Agrostoth. n. 53; *C. echinatus,* var. Trin. in Mem. Acad. Petersb. ser. 6, iii. 173.

Queensland. Northumberland Islands, *R. Brown;* Brisbane River, Moreton Bay, *F. Mueller, Bailey;* Rockhampton and neighbouring districts, *Bowman, O'Shanesy* and others.

N. S. Wales. George's Head, *R. Brown;* Port Jackson to the Blue Mountains, *Woolls, C. Moore,* and others; Macleay and Clarence Rivers, *Beckler, Wilcox;* Richmond River, *C. Moore;* New England, *C. Stuart.*

Very near the *C. calyculatus,* Cav. (*C. anomoplexis,* Labill.) from the South Sea Islands and New Caledonia, which however seems to differ in the larger involucres enclosing frequently 2 spikelets, in the outer glume much longer and more acute and other minor differences. Both species vary in the one inner bristle much longer than the others or not exceeding them.

2. **C. inflexus,** *R. Br. Prod.* 195.—A tall glabrous grass, resembling *C. australis* in foliage. Spike more dense in the specimens seen, 2 to 2½ in. long, close above the last leaf. Involucres sessile or nearly so, about the size of those of *C. australis* but rather broader and shorter; inner lobes 6 to 8, narrow-lanceolate, rigid, not ciliate but slightly pubescent on the back, inflexed over the fruit, the outer bristles as in *C. australis.* Spikelets solitary according to R. Brown, but in one of the two involucres I opened I found 2, in the other 3, all in seed. Glumes rather acute, the 2nd and 3rd 5-nerved, all membranous enclosing the grain.

N. Australia. Arnhem N. Bay, *R. Brown.*

8. **C. elymoides,** *F. Muell. Fragm.* viii. 107.—An erect grass of several feet. Leaves flat or convolute, often very long, the sheaths and under surface villous with soft hairs. Spike 4 to 6 in. long. Involucres sessile, about 5 lines long, close together or rather distant along the flexuose rhachis. Inner bristles or lobes about 8, flat, shortly ciliate, not inflexed; outer ones shorter, rather numerous, subulate, one narrow inner one awnlike and at least twice as long as the others, all scabrous with asperities turned upwards. Spikelets usually 3. Outer glume very short and hyaline; 2nd glume nearly as long as the 3rd. A male flower in the 3rd glume of the central spikelet, often a palea only in the lateral spikelets. Terminal or fruiting glume enclosing a hermaphrodite or female flower, or sometimes only a male flower in the lateral spikelets.

N. Australia. Sturt's Creek, *F. Mueller;* Port Darwin, *Schultz*, *n.* 59, 193.
Queensland. Cape York, *Daemel*.

9. CHAMÆRAPHIS, R. Br.

Spikelets with 1 terminal flower usually female by abortion and a male one below it, few and distant or solitary on the filiform branches of a simple panicle, the partial rhachis produced into a long awnlike point beyond the insertion of the upper or only spikelet. Glumes 4, the outer empty one very small, the 2nd and 3rd nearly equal, membranous or at length rigid, many-nerved, often tapering to a point but not awned, the 3rd with a palea and 3 stamens in its axil, the 4th or fruiting glume shorter and very faintly nerved. Palea with inflected margins but not auriculate. Staminodia usually 2, very slender, with small abortive anthers. Styles very shortly united at the base. Grain enclosed in the scarious or rather rigid fruiting glume and palea, but free from them.—Semi-aquatic grasses, glabrous or nearly so. Leaves flat, the ligula short.

Besides the three Australian species, one of which extends over tropical Asia, there is one other closely allied to it in Ceylon and the Indian Peninsula. The tropical American *Paratheria prostrata*, Griseb. (*Panicum leptachyrium*, Döll. in Mart. Fl. Bras. ii. part ii. 150, t. 25) is very closely allied to *Chamæraphis* and has the same peculiar inflorescence, but the internal structure of the spikelets may be sufficiently distinct to justify the retaining it as a separate genus.

Panicle spreading, with distant spikelets on filiform branches. Fruiting glume short and obtuse . . . . 1. *C. spinescens.*
Panicle spikelike but loose, the spikelets often 2 together on the lower branches. Fruiting glume acute. Outer glume ½ line long, membranous . . . . 2. *C. paradoxa.*
Panicle spikelike and close, the spikelets all solitary at the base of the long awnlike branches. Fruiting glume acuminate. Outer glume scarcely prominent, callous and truncate . . . . 3. *C. hordeacea.*

1. **C. spinescens,** *Poir. Dict. Suppl.* ii. 189.—Stems creeping at

the base and when in water forming large floating masses. Leaves linear-lanceolate, flat, with loose flattened sheaths, quite smooth or slightly scabrous. Panicle 2 to 4 in. long, with rather numerous filiform flexuose spreading branches produced beyond the last spikelet into an awnlike point always longer than the spikelet. Spikelets few on each branch, distant, shortly pedicellate but closely appressed in each bend of the rhachis, the pedicels and rhachis usually minutely scabrous-ciliate, the spikelet very narrow, about 3 lines long in the typical form. Outer glume about ½ line long, thinly membranous, the 2nd many-nerved, tapering to a long point, the 3rd usually rather smaller with a shorter point and fewer nerves, enclosing the male flower, the fruiting glume much shorter, obtuse, very thin, and remaining thin as well as the palea over the grain, which readily falls out of them.—*C. aspera*, Nees in Wall. Cat. Herb. Ind. n. 8679; *Panicum spinescens*, R. Br. Prod. 193.

Queensland. Moreton Bay, *F. Mueller*; East Australian lagoons, *Leichhardt*,

N. S. Wales. Port Jackson, *R. Brown*; Blue Mountains, *Woolls*.

Victoria. Lower Mitta-Mitta and Broken Rivers, *F. Mueller*.

Var. *parvispicula*, differing only in the much smaller spikelets.—*Panicum abortivum*, R. Br. Prod. 193; *Chamæraphis abortiva*, Poir. Dict. Suppl. ii. 189.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; between the Norman and Gilbert Rivers, *Gulliver*.

Queensland. Rockingham Bay, *Dallachy*.

The species is generally spread over East India from Ceylon and the Peninsula to the Malayan Archipelago and South China.

2. **C. paradoxa,** *Poir. Dict. Suppl.* ii. 189.—A smaller plant than *C. spinescens*. Leaves mostly short and spreading. Panicle almost reduced to a simple spikelike raceme, the awnlike branches mostly bearing only a single spikelet near the base, the lower ones only occasionally more elongated with two distant spikelets, the rhachis always produced into a long awn exceeding the spikelet. Spikelets acuminate, 4 to 5 lines long. Outer glume broad, thinly membranous, about ½ line long, the 2nd and 3rd glumes nearly equal, striate with many nerves; fruiting glume oblong, acute, nearly 2 lines long, thin and almost nerveless.—*Panicum paradoxum*, R. Br. Prod. 193; Kunth, Rev. Gram. t. 32; Gaudich. in Freyc. Voy. Bot. t. 24.

N. S. Wales. Confluence of the Nepean and Grose Rivers, *R. Brown*; Manly Swamps, *Woolls*.

Victoria. Swamps between Snowy River and Lake King, *F. Mueller*.

3. **C. hordeacea,** *R. Br. Prod.* 194.—Stems 1½ ft. long. Leaves flat, longer than in *C. spinescens*, glabrous or nearly so. Panicle dense and spikelike, cylindrical, about 1½ in. long, much narrower than in *C. paradoxa*, the branches bearing each a single spikelet very near the base but produced into a capillary awn often 1 to 2 in. long, giving the spike a very barley-like aspect. Spikelets cylindrical, 3 to 4 lines long,

surrounded by a few hairs at the base. Outer glume exceedingly short, callous and truncate, 2nd and 3rd nearly equal, many-nerved, narrower and more rigid than in *C. paradoxa*.—Kunth, Rev. Gram. i. 249, t. 36; *Panicum chamæraphis*, Trin. in Mem. Acad. Petersb. ser. 6, iii. 217.

N. Australia. Islands off the North Coast, *R. Brown*. The three styles observed by R. Brown must have been in an exceptionally abnormal flower. In the spikelets examined by Kunth, as well as in two I have examined from R. Brown's specimens, there were but two. I have seen the species in no other collection.

10. STENOTAPHRUM, Trin.

(Diastemanthe, *Steud.*)

Spikelets with 1 terminal hermaphrodite flower and a male or imperfect one below it, usually 2 to 4 together in very short spikes embedded in the alternate notches of the broad rhachis of a spikelike panicle, the rhachis of the partial spike usually produced into a short point beyond the insertion of the spikelets, and the common rhachis often disarticulating transversely between the notches when old. Glumes 4. the lowest empty and very small, the 2nd empty and the largest, membranous but rigid, 3- or 5-nerved, the 3rd and 4th flowering, rather smaller, with the nerves less prominent and of a somewhat firmer texture. Palea within both glumes of a similar consistence. Styles distinct. Grain enclosed in the rather rigid but thin palea and flowering glume and free from them.

A small genus dispersed over the tropical and sub-tropical regions of the New and the Old World. The only Australian species is a widely spread one, chiefly in maritime districts and is believed to have been introduced into Australia.

1. **S. americanum,** *Schrank; Kunth, Enum.* i. 138.—A glabrous rather coarse grass creeping and rooting at the base, ascending to about 1 ft., the stems somewhat flattened. Leaves obtuse, flat or involute, the sheaths usually broad and flat, ciliate at the orifice. Spikes solitary and terminal, 2 in. long or more, the rhachis flat and flexuose, 1 to 2 lines broad, readily disarticulating transversely between the notches when old, though apparently continuous when in flower. Spikelets 2 or 3 together on very short flat or angular branches in the alternate notches of the common rhachis, the partial rhachis continued beyond the insertion of the uppermost spikelet, but not usually exceeding it, the spikelets sessile, oval-oblong, acute or acuminate, 2 to 2½ lines long. all half immersed in the notches.—F. Muell. Fragm. viii. 156; *S. glabrum*, Trin. Fund. Agrost. 176; *Rottboellia compressa*, Beauv. Agrost. t. 21, f. 8; *Diastemanthe platystachys*, Steud. Syn. Glum. i. 360.

N. Australia. N. W. Coast, *Wickham;* Foul Point, *A. Cunningham.*
Queensland. Wreck Reef, *Denham;* also in *Leichhardt's* collection.

N. S. Wales. Port Jackson, *U. S. Exploring Expedition*; "an introduced grass, now known as Buffalo grass," *F. Mueller*.

The species is dispersed over the tropical regions both of the New and the Old World, chiefly near the sea.

11. XEROCHLOA, R. Br.

Spikelets with 1 terminal hermaphrodite flower and frequently a male one below it, few in a short simple or branched spike almost enclosed in distant sheathing bracts along the main axis of the panicle, with a bract under each branch or spikelet. Glumes 4, thin, the outer one short, the 2nd longer, the 3rd the longest with a large very prominently 2-nerved palea and often 3 stamens. Terminal flowering glume shorter and very thin. Palea broad, closely enveloping the flower and fruit. Styles united almost up to the rather long plumose stigmas. Grain enclosed in the thin palea, free from it.

The genus is limited to *Australia.*

Spikelets glabrous	1. *X. imberbis.*
Pedicel 2nd glume and palea of the 3rd glume densely bearded, at least in the upper spikelets	2. *X. barbata.*
Pedicel 2nd glume and palea of the 3rd glume densely covered with long intricate woolly hairs	3. *X. laniflora.*

1. **X. imberbis,** *R. Br. Prod.* 197.—Very closely allied to *X. barbata*, with a similar habit and foliage. The flowering bracts appear to be rather narrower and more distant, more frequently terminating in a point or lamina. Spikes branched, with 5 or 6 spikelets on each branch, but the whole not much exceeding the outer bract. Glumes and paleæ as in *X. barbata*, except that they are all glabrous.—F. Muell. Fragm. viii. 117.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; Cygnet Bay, *A. Cunningham*; Victoria River and Sturt's Creek, *F. Mueller*; Port Darwin, *Schultz*, n. 337.

2. **X. barbata,** *R. Br. Prod.* 197.—Stems from a branching base erect, usually about 1 to 2 ft. high. Leaves in the lower part of the plant narrow, almost terete, erect and rigid. Inflorescence occupying the upper part of the plant. Primary bracts rather distant along the simple general rhachis, rather broad and sheathing, about ½ in. long, erect, cartilaginous, produced into a very short obtuse or truncate erect lamina, each enclosing a simple or slightly branched spike of few spikelets often scarcely exceeding the outer bract, each spikelet on a short thick pedicel enclosed in a many-nerved glume-like bract and occasionally interspersed with smaller empty bracts. Spikelets 2½ to 3 lines long; the lower ones glabrous except a few long cilia on the margin of the 2nd glume and the nerves of the palea of the 3rd, the lowest spikelet sometimes barren. In the upper spikelet the pedicel, the nerves of the palea of the male flower and the margins of the 2nd

glume usually densely ciliate or bearded. Grain much shorter than the enveloping palea.—F. Muell. Fragm. viii. 117.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* Albert River, *Henne.*

3. **X. laniflora,** *Benth.*—More branched and leafy than *X. barbata,* our specimen under 1 ft. high with a short creeping base, with something of the aspect of *Anthistiria membranacea* or of *Apluda mutica.* Sheathing bracts enclosing the spikes several, approximate at the ends of the branches, with one or two lower down and more distant, forming a broad leafy panicle, the bracts less rigid than in *X. barbata.* Structure of the spike and spikelets the same as in *X. barbata,* but the wool of the rhachis short pedicels and base or back of the 2nd glume and of the palea of the male flower very long, dense and intricate, the sheathing and subtending bracts, the protruding ends of the glumes of the fertile flowers and sometimes the lowest spikelet remaining glabrous —*Anthistiria ? laniflora,* F. Muell. in Herb. Hook.

N. Australia. Sturt's Creek, *F. Mueller.* This is probably the plant alluded to by F. Muell. Fragm. viii. 117, as allied to *Neurachne.* The want of the rigid habit which suggested the generic name would make it at first difficult to regard it as a congener, but on examination there appears to be nothing but the habit and the wool of the spikelets to distinguish it.

12. THUAREA, Pers.

(Microthuarea, *Beauv.;* Thouarea, *Kunth;* Ornithocephalochloa, *Kurz.*)

Spikelets monœcious, in a simple one-sided spike, enclosed in a spatha-like bract, the upper (4 to 6) spikelets with 2 male flowers, the 1 or 2 lower ones with one female or hermaphrodite flower and a rudimentary or male one below it. Glumes 4, the outer one small and hyaline (or sometimes wanting ?), flowering ones when perfect with a perfect palea. Styles distinct, slender, with very densely plumose brush-like stigmas. In fruit the bract under the spike falls away, the lower part of the rhachis becomes much dilated, envelops the fruiting spikelet, and is said to bury itself in the sand, the fruiting glume and palea stiffened but scarcely hardened, the grain enclosed but free.

The genus contains only a single species common on sandy sea shores from the Mascarene to the Pacific Islands.

1. **T. sarmentosa,** *Pers. Syn.* i. 110.—Stems creeping and rooting to a great extent, shortly ascending under the inflorescence. Leaves flat, lanceolate, broad or narrow, 1 to 2 in. long, minutely but densely or sometimes sparingly silky-pubescent on both sides. Spike usually about 1 in. long, the spikelets about 2 lines; 2nd and 3rd glumes of the lower fertile one nearly equal, 7- or 9-nerved. Fruiting glume more rigid, but thin and glabrous. In the male spikelets the small outer glume often deficient, the 2nd hairy, the 3rd and 4th rather

longer, glabrous, each enclosing a male flower.—Kunth Revis. Gram. t. 35; *T. latifolia*, *T. media* and *T. involuta*, R. Br. Prod. 198; *Ornithocephalochloa arenicola*, Kurz in Trim. Journ. Bot. iv. (1875), 332, t. 171.

N. Australia. Arnhem North Bay, *R. Brown.*

Queensland. Endeavour River, *Banks and Solander*; Rockingham Bay, *Dallachy.*

There appears to be but one species ranging from Madagascar to the Society Islands. In the more slender specimens, usually minutely and sparingly pubescent but never quite glabrous, there is usually but one fertile spikelet in the spike; in the vigorous very silky ones, such as Dallachy's and some from the Friendly Islands, there are usually but not always two.

13. SPINIFEX, Linn.

Spikelets diœcious, spicate or solitary on partial rhachises collected in dense globular heads with a bract under each rhachis. Male plant: Spikelets usually several to each bract, spicate or clustered, 2-flowered. Glumes 4, nearly similar, 2 outer empty ones sometimes smaller sometimes larger than the 2 flowering ones. A perfect palea and 3 stamens within each flowering one. Fertile plant: Spikelets solitary within each bract at the base of a partial rhachis, with one female or hermaphrodite flower and an imperfect or rudimentary or sometimes a male flower below it. Glumes 4 as in the males, the 3rd with a more or less developed palea and sometimes 3 stamens or staminodes. Palea in th 4th glume perfect. Stamens 3, often imperfect. Styles 2, distinct with long shortly plumose stigmas. Grain enclosed in the hardened glume and palea and free from them.—Spreading or creeping hard branching grasses, the flowering branches subtended by leafy or lanceolate and concave bracts.

Besides the three Australian species, of which one extends to the coasts of New Zealand and New Caledonia, there is a fourth very closely allied to one of the Australian ones, widely spread along the sandy sea-shores of tropical Asia.

Heads of spikelets several inches diameter. Male spikelets in spikes of 1 to 1½ in. Females at the base of rigid rhachises of 3 to 4 in.
  Plant silky-pubescent or villous . . . . 1. *S. hirsutus.*
  Plant glabrous . . . . 2. *S. longifolius.*
Heads of spikelets not above 1 in. diameter. Male spikelets solitary or clustered within small bracts. Females within broad bracts, the rhachis shorter than the spikelet and sometimes minute or obsolete . . . . 3. *S. paradoxus.*

1. **S. hirsutus,** *Labill. Pl. Nov. Holl.* ii. 81, *t.* 230, 231.—Stem stout, creeping in the sand, forming large tufts. Leaves often above 1 ft. long with involute margins, clothed as well as the whole plant with silky or woolly hairs. Male plant: Spikes sessile or pedunculate, few or many in a terminal head or umbel and often a cluster of 2 or 3 spikes or a single spike lower down on the stem, each spike 1 to 1½ in.

long, the rhachis produced into a point usually exceeding the spikelets and sometimes very long. Bracts under the spikes or peduncles lanceolate, acuminate, concave. Spikelets sessile in the spike or scarcely pedicellate, 5 to 6 lines long. Glumes membranous, hairy, the empty ones 5- or 7-nerved, usually as long as or longer than the flowering ones. Fertile plant: Spikelets very numerous in a large dense globular head, each one solitary at the base of a spine-like rhachis of 4 in. or more, subtended by a much shorter linear-lanceolate bract, the spikelet 6 to 7 lines long, acute or acuminate. Glumes all nearly similar, with 7 or more nerves, the 2 outer ones rather the largest with more nerves than the others. A palea and sometimes 3 stamens in the axil of the 3rd, and an ovary and 3 stamens or staminodes in the terminal one.—Sieb. Agrostoth. n. 62; Hook. f. Fl. Tasm. ii. 106; F. Muell. Fragm. viii. 138; *S. sericeus*, R. Br. Prod. 198.

Abundant on the sandy sea shores of **Queensland** from Rockingham Bay southward (Broad Sound, *R. Brown*), **N. S. Wales, Victoria, Tasmania, S. Australia** to the south coast of **W. Australia** (King George's Sound, *R. Brown* and others). Also New Zealand and New Caledonia.

S. alterniflorus, Nees in Pl. Preiss. ii. 96, from the character given, would belong to *S. hirsutus*, but the specimens I have seen from Swan River, Preiss, n. 1833, belong rather to *S. longifolius*. Both species are in West Australia, but, as far as I have seen, *S. longifolia* from the north down the west coast to Swan River, and *S. hirsutus* only on the south coast.

2. **S. longifolius,** *R. Br. Prod.* 198.—Closely resembles *C. hirsutus* but quite glabrous except the long cilia of the ligula and sometimes a few on the margins of the leaf-sheaths. Leaves narrow, rigid, often above 1 ft. long but not so pungent as in the Asiatic *S. squarrosus*, of which *S. longifolius* may perhaps be a variety only. Male spikes usually looser than in *S. hirsutus*. Spikelets scarcely 5 lines long, the outer empty glumes shorter than the flowering ones. In the female spikes the outer glumes quite as long as the inner ones, and I found no palea or stamens in the 3rd glume in the spikelets examined.—Nees in Pl. Preiss. ii. 95; F. Muell. Fragm. viii. 139; *S. fragilis*, R. Br. l.c.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* Careening Bay, covering the whole coast, *A. Cunningham;* Quail Island, *Flood;* Nichol Bay, *Walcot;* Port Darwin, *Schultz, n.* 199, 200.

W. Australia. Sharks Bay, *Milne;* Murchison River, *Oldfield;* Swan River, *Drummond, Preiss, n.* 1833, *Oldfield*, and possibly King George's Sound.

3. **S. paradoxus,** *Benth. in Hook. Ic. Pl. t.* 1243, 1244.—Glabrous, divaricately branched, rigid and brittle but not so stout as the preceding species, the branches in clusters of 3 to 6 surrounded by short leaves with loose sheaths, the lower stem-leaves long and narrow; the ligula a dense ring of cilia. Male plant: Spikelets in a dense cluster or head of ½ to ¾ in. diameter, 1 to 3 outer bracts lanceolate and about as long as the head, the inner ones much reduced, the spikelets about 3 lines

long, the outer ones nearly sessile, the inner ones pedicellate and sometimes 2 on a pedicel, the pedicel or axis produced into a point shorter than the spikelet. Outer empty glumes 2, several-nerved; flowering glumes 2, nearly equal, longer than the empty ones, each with a palea and 3 stamens. Female plant: Heads the size of the males when in flower, but the bracts larger and broader, and when in fruit the bracts variously enlarged, 1 or 2 often becoming curved, 1 in. long or more, broad with hard centres and scarious margins, sometimes all scarcely changed. Spikelets almost sessile within each bract, the very short pedicel produced into a point much shorter than the spikelet, and sometimes minute or obsolete. Empty glumes prominently 7- or 9-nerved, the 2 outer rather shorter than the 3rd, which is either empty like them or contains a small palea. Fruiting glume shorter, very acute, smooth and shining. Styles distinct.—*Neurachne paradoxa*, R. Br. in App. Sturt Exped. 26; *Panicum pseudoneurachne*, F. Muell. Fragm. viii. 199.

N. S. Wales. Murray and Darling Rivers, *Beckler*, *Dallachy*.
Central Australia. Between Stokes Range and Cooper's Creek, *Howitt;* near Lake Eyre, *Andrews;* Alice Springs, *Giles*.

The male plant was unknown to R. Brown and unfortunately overlooked by F. Mueller, which accounts for the generic misplacement of the species.

TRIBE II. ANDROPOGONEÆ.—Fertile spikelets with 1 terminal hermaphrodite or female flower, with or without a male one below it, the pedicel usually articulate immediately under the outer glume. Glumes 4 or rarely fewer, the outer one or rarely the 2nd the largest, enclosing the inner ones as well as the flower and fruit, the 3rd glume smaller, usually thin, hyaline and empty, rarely deficient, or rather larger and enclosing a male flower, the upper or flowering glume very thin and hyaline, sometimes entire and awnless, often notched or 2-lobed and bearing a bent awn twisted below the bend, sometimes reduced to a long awn without any basal dilatation. A palea to each flower, often very minute, rarely quite deficient. Stamens 3 or fewer. Lodicules usually small and hyaline or deficient. Styles free or united at the base, with feathery stigmas.

The very thin hyaline and small upper glumes readily distinguish the Andropogoneæ from the Paniceæ, except in the subtribe of Tristegineæ where their texture is firmer, but the bent and twisted awns are those of Andropogoneæ and never occur in Paniceæ.

SUBTRIBE I. ZOYSIEÆ.—Spikelets solitary or rarely in clusters of 2 or 3, inserted all round the inarticulate rhachis of a simple spike or raceme. Awns none on the flowering glume, none or straight on the outer ones.

14. ZOYSIA, Willd.

Spikelets 1-flowered, not awned, nearly sessile in a close spike, not distichous, the rhachis continuous. Glumes 2, the outer one broad, complicate, keeled, the inner flowering one much smaller, thin and hyaline. Palea still smaller. Styles distinct. Grain free, enclosed in the somewhat hardened outer glume.

Besides the Australian species, which is common in maritime sands of tropical and eastern Asia and New Zealand, there appear to be one or two natives of Japan or China.

1. **Z. pungens,** *Willd.; Kunth, Enum.* i. 471.—Rhizome creeping in the sands to a great extent, with erect stems rarely above 6 in. high. Leaves flat or convolute, with rigid subulate often pungent points, glabrous except a few cilia at the orifice of the rather loose sheaths. Spike terminal, 1 to 1½ in. long. Spikelets erect, closely appressed in the notches of the rhachis, 1½ to 2 lines long. Outer glume rather acute, broad, smooth and shining, the sides nerveless. Flowering glume completely enclosed, usually much smaller thin and hyaline, but sometimes more than half the outer one and rather more rigid.—R. Br. Prod. 208; F. Muell. Fragm. viii. 116; Benth. Fl. Hongk. 418, with the synonyms adduced; Sieb. Agrostoth. n. 52.

Queensland. Port Curtis and Moreton Island, *M'Gillivray.*
N. S. Wales. Port Jackson, *R. Brown*; Saltmarshes near Redbank, *Woolls.*
Victoria. Sandy coasts of Eastern Gipps' Land, *F. Mueller.*
Tasmania. King's Island, *Neate.*

This is certainly the same as the Hong Kong plant I had referred to *Z. pungens*; the *Z. sinica*, Hance in Seem. Journ. Bot. 1869, 168, also from Hong Kong, appears to be a distinct species and should probably include the Japanese *Z. macrostachya*, Franch. and Sabat. Enum. Pl. Jap. ii. 187.

15. LAPPAGO, Schreb.

(Tragus, *Desf.*)

Spikelets 1-flowered, not awned, 2 or rarely 3 or 4 together on very short pedicels along the continuous rhachis of a simple spikelike panicle. Glumes usually 3, the outer one, next the rhachis, very minute and sometimes obsolete, the 2nd empty with 5 prominent nerves armed with short rigid hooked bristles, the 3rd or flowering glume and enclosed palea thin and hyaline. Styles distinct, slender. Grain enclosed in the thin palea and glume and rigid outer glume, free from them.

Besides the Australian species which is a common weed in most tropical and temperate regions in the New and the Old World, there are one or two others very closely allied to it. The systematic position of the genus may require further investigation, but its affinities appear to be rather with Andropogoneæ than with any other tribe.

1. **L. racemosa,** *Willd.; Kunth, Enum.* i. 170, *Revis. Gram. t.*

120.—An annual spreading on the ground or ascending to from 6 in. to 1 ft. in height, usually glabrous, except a few rigid cilia bordering the leaves. Leaves flat, with loose sheaths, the ligula small, split into cilia. Spikelike panicle or raceme 2 to 4 in. long, cylindrical and narrow, the very short peduncles bearing on their end 2 sessile narrow spikelets about 2 lines long, falling off together with the peduncle as little burs, the 2nd glumes with their hooked prickles forming the principal part of the spikelets, the acuminate almost aristate fruiting glumes remaining enclosed within them.—F. Muell. Fragm. viii. 107; Reichb. Ic. Fl. Germ. t. 30; *Tragus racemosus*, Desf.; Döll. in Mart. Fl. Bras. ii. part ii. t. 18.

N. Australia. Sturt's Creek, *F. Mueller.*

Queensland. Rockhampton and neighbouring districts, *Bowman, O'Shanesy* and others; Warwick, *Beckler;* Depot Camp, *Mitchell.*

N. S. Wales. New England, *C. Stuart;* Maneroo, *Woolls;* from the Darling to Cooper's Creek, *Victorian Expedition* and various other collectors.

Victoria. Wimmera, *Herb. F. Mueller.*

S. Australia. In the interior, *Giles, M'Douall Stewart.*

In several tropical specimens there is a third or even a fourth spikelet on each peduncle, but I have never seen more than two in the Australian ones.

16. NEURACHNE, R. Br.

Spikelets with 1 terminal hermaphrodite flower, and very rarely a second male one below it, sessile along the continuous rhachis of a simple ovoid or cylindrical spike. Glumes 4, the 2nd the largest, fringed on each side at least in the lower half with long spreading cilia on the intramarginal nerve; 3rd glume smaller and thinner, usually with a small palea in its axil. Fruiting glume smaller thin and often hyaline, the palea also very thin, as long as or longer than the glume. Styles distinct. Grain enclosed in the thin palea and glume, free from them.

The genus is limited to Australia.

Spike ovoid or oblong, ¾ to 1 in. long. Outer glume 5- or 7-nerved, with long spreading hairs on the back . 1. *N. alopecuroides.*

Spike narrow, 1 to 2 in. long. Outer glume with a transverse callosity on the back bearing long cilia, and below it an ovate very thin space bordered by a thickened margin . . . . 2. *N. Mitchelliana.*

Spike narrow, 1 to 2 in. long. Outor glume thin, glabrous or bordered by very few cilia . . . . 3. *N. Munroi.*

1. **N. alopecuroides,** *R. Br. Prod.* 196.—Stems erect, 1 to 1½ ft. high, with the nodes usually hairy, otherwise glabrous. Leaves rather short, narrow and rigid, mostly at the base of the stem, glabrous except the dense cilia of the ligula, the upper ones few and small. Spike ovoid or oblong, ¾ to 1 in. long. Spikelets numerous, densely crowded all round the rhachis, but spreading and very readily falling away, a few at the base of the spike barren and almost reduced to single ciliate glumes, but more persistent and forming an involucre at the base

of the spike. Each spikelet about 3 lines long, with a tuft of hairs at the base. Outer glume rather shorter, 5- or 7-nerved, tapering to a fine point with a few spreading hairs on the back; 2nd glume many-nerved, tapering to a fine point, densely ciliate with long hairs on each side; 3rd glume rather shorter, with few nerves, sprinkled with a few short hairs. Fruiting glume and palea thin and hyaline.—Nees in Pl. Preiss. ii. 95; F. Muell. Fragm. viii. 200; Hook. Ic. Pl. t. 1241.

Victoria. Glenelg River, *Robertson*; Grampians, *F. Mueller*, *Sullivan*; Wimmera, *Dallachy*.

S. Australia. Lofty Range and Bethanie, *F. Mueller*.

W. Australia. King George's Sound and neighbouring districts, *Menzies*, *R. Brown* and others; Swan River, *Drummond*, *1st coll. Preiss*, *n.* 1840; Vasse and Tone Rivers, *Oldfield*.

2. **N. Mitchelliana,** *Nees in Hook. Lond. Journ.* ii. 410.—Stems from a knotty woolly branching base erect, leafy to the inflorescence or nearly so. Leaves flat, short, spreading, ciliate with a few long hairs or the lower ones woolly-hairy. Spike narrow-cylindrical, 1 to near 2 in. long. Spikelets about 2 lines long, with a tuft of hairs at their base. Outer glume as long as the others, many-nerved, ciliate, marked in the centre on the back with a transverse callosity bearing long rigid horizontally spreading hairs, with a broad cavity underneath it, very thin and almost hyaline, bordered by a prominent nerve on each side; 2nd glume broad to above the middle, pubescent on the back and densely fringed on each side by long spreading hairs, the upper part narrow and glabrous or nearly so; 3rd glume shorter, thin, faintly nerved and not ciliate, either empty or enclosing a small palea. Fruiting glume and palea thin and almost hyaline.—F. Muell. Fragm. viii. 200; Hook. Ic. Pl. t. 1240.

N. S. Wales. Bogan River, *Mitchell*; Darling Desert, *Victorian Expedition* and others.

3. **N. Munroi,** *F. Muell. Fragm.* viii. 200.—Habit of *N. Mitchelliana*. Stems from a more or less woolly knotty base under 1 ft. high. Leaves narrow, convolute or subulate, ciliate at the nodes and ligula, otherwise glabrous. Spike narrow-cylindrical, 1 to near 2 in. long, the rhachis pubescent. Spikelets 2½ to 3 lines long, with a tuft of hairs at their base. Outer glume nearly as long as the spikelet, thin, glabrous or with a few marginal cilia; 2nd glume more rigid, acutely acuminate, with about 7 very prominent nerves, the marginal ones fringed in the lower half with long cilia; 3rd glume shorter, much thinner, glabrous, about 5-nerved, with a small palea. Fruiting glume and palea thin and hyaline, the palea larger than the glume.—Hook. Ic. Pl. t. 1239; *Panicum Munroi*, F. Muell. Fragm. v. 204

N. S. Wales. Darling Desert, *Beckler*.

17. PEROTIS, Ait.

Spikelets 1-flowered, sessile or shortly pedicellate along the continuous rhachis of a loose simple spike or raceme. Glumes 3, 2 outer empty ones linear, rigid, tapering into long terminal straight awns; the lowest the longest. Terminal flowering glume much smaller, thin and hyaline, the palea still smaller. Styles very shortly united at the base, the plumose stigmas short. Grain narrow, free, longer than the terminal glume, enclosed in the 2 rigid outer ones.

The genus extends over tropical and sub-tropical Asia and Africa, the Australian species, closely allied to the common Asiatic and African one, appears to be represented in the Malayan Archipelago.

1. **P. rara**, *R. Br. Prod.* 172.—Stems from a decumbent or branching base, slender, ascending to 1 ft. or rather more. Leaves linear, with subulate points, glabrous except a few marginal cilia especially at the orifice of the sheaths; ligula ciliate. Spike or raceme in some specimens 3 to 4 in., in others at least twice as long. Spikelets always numerous, at first erect at length reflexed, in some specimens almost sessile, in others on pedicels of ¼ to above ½ line long, often ciliate with a few hairs; the spikelets very narrow, 2 to 3 lines long without the fine awns which are ½ to 1 in. long. Outer glume with a prominent keel, sometimes glabrous, in a few specimens ciliate with rather long hairs, 2nd glume similar but rather shorter and narrower.—F. Muell. Fragm. viii. 115.

N. Australia. Between Norman and Gilbert Rivers, *Gulliver*; in the interior of Arnhem's Land, *M'Douall Stuart*.

Queensland. Port Curtis and Cape Upstart, *M'Gillivray*; Port Denison, *Fitzalan*; Rockhampton and numerous stations in South Queensland, *Bowman*, *O'Shanesy* and many others; Balonne River, *Mitchell*; towards Cooper's Creek, *Neilson*.

Although generally very different from the common tropical species of *Perotis* (*P. latifolia*, Ait. with broader leaves and much shorter spikelets), there certainly appear to be connecting forms, especially that from the Philippine Islands which Trinius described as *Xystidium maritimum*, and which has been regarded as a slight variety of *P. rara*.

SUBTRIBE II. ROTTBOELLIEÆ.—Spikelets awnless, in pairs or rarely solitary, in alternate notches of the articulate rhachis of a simple spike, one sessile fertile and more or less embedded in a cavity of the rhachis, the other pedicellate and barren or rarely fertile.

This subtribe differs from the spicate Euandropogoneæ in the total absence of any awn and in the rhachis more deeply excavated for the reception of the sessile spikelet. A few species of *Ischæmum* are however intermediate as it were between the two subtribes.

18. ELIONURUS, Willd.

Spikelets in pairs, in the alternate notches of the articulate rhachis of a simple spike, 1 sessile with 1 hermaphrodite flower, the other pedicellate and barren, the spike solitary and densely silky-hairy. Outer glume of the barren spikelet usually spreading. Fertile spikelet appressed. Glumes 4, the outer one the largest erect and 2-lobed, the 2nd shorter, thin but rigid and pointed, 3rd and 4th shorter very thin and hyaline, all without awns. Palea none (or very minute?). Styles distinct. Grain enclosed in the outer glumes, free from them.

The genus is spread over tropical and subtropical America and Africa, extending sparingly into Western Asia. The only Australian species is endemic.

1. **E. citreus,** *Munro.*—Stems slender, 1½ to 2 ft. high. Lower leaves very narrow, almost subulate, with short broad sheaths; upper ones with long loose sheaths passing into the sheathing bracts, the upper one on the peduncle below the spike. Spike 3 in. long, densely silky with the spreading hairs of the rhachis and pedicels. Barren spikelets on a short broad pedicel, the outer glume narrow, very acute, spreading, fringed with long cilia, the 2nd erect rather shorter, the prominent keel produced into a fine point, the 3rd small and hyaline; no flower. Sessile spikelet erect and appressed, much flattened, 5 to 6 lines long. Outer glume lanceolate, 7-nerved, the 2 lateral nerves thickened ciliate and produced into long erect ciliate lobes or thick points, 2nd glume ½ as long, finely pointed.—*Andropogon citreus,* R. Br. Prod. 203.

Queensland. Northumberland Islands, *R. Brown;* "Native Wells," *Armit.*

19. HEMARTHRIA, R. Br.

Spikelets in pairs, in the alternate notches of a simple spike, 1 sessile and half embedded in a cavity of the scarcely articulate rhachis with 1 hermaphrodite flower, the other on a closely appressed and often adnate pedicel reduced to 2 or 3 empty glumes, the spikes single on each peduncle above a sheathing bract and often flattened. Glumes in the sessile spikelet 4, the outer one appressed and covering the cavity of the rhachis, the 2nd thinner and concave or keeled, the 3rd and 4th and the palea in the 4th thin and hyaline. Styles distinct. Grain enclosed in the glumes but free from them.

A small genus of closely allied species, widely spread over the warmer regions of the globe especially on the sea-coasts of the Old World, the Australian species very closely allied to, if not identical with, a common Asiatic and Mediterranean one.

1 **H. compressa,** *R. Br. Prod.* 207.—Stems decumbent or creeping at the base, rather rigid, ascending to 1 ft. or rather more, slightly branched. Leaves narrow, glabrous or the lower ones sprinkled with a few long hairs. Spikes solitary on the branches or nearly so, more or less compressed, rigid, 3 to 5 in. long, often 1½ lines broad. Spikelets all closely appressed, 3 to 3½ lines long. Outer glume many-nerved, tapering into a very variable point, sometimes very short and straight especially in the sessile spikelet, sometimes elongated and fine or

minutely hooked at the extremity, or in southern specimens, especially towards the end of the spike, terminating in a rather long inflexed rigid hook. In the pedicellate spikelet the point of the outer glume is often longer finer and straight, but occasionally that also is hooked and more rarely the 2nd glume ends in a small hook.—*H. uncinata*, R. Br. l. c., Hook. f. Fl. Tasm. ii. 107; Brongn. in Duperr. Voy. Bot. t. 15.

Queensland. Brisbane River, Moreton Bay, *F. Mueller*, *Bailey;* Rockhampton, *O'Shanesy;* Dawson River, *F. Mueller*; also in *Leichhardt's* collection.

N. S. Wales. Port Jackson, *R. Brown*, *Woolls* and others, *Sieber*, *n.* 88; Hastings and Clarence Rivers, *Beckler*, *Wilcox.*

Victoria. Yarra, Ovens and Upper Hume Rivers, Dandenong Ranges and several other localities, *F. Mueller* and others.

Tasmania. Derwent River, *R. Brown;* Northern Coasts of the Island, *Gunn;* South Port, *C. Stuart.*

S. Australia. Lobethal and near Adelaide, *F. Mueller.*

W. Australia. Common about Swan River and King George's Sound, *Fraser*, *A. Cunningham*, *Drummond*, *n.* 152, 385, and others.

The hook at the end of the glumes, upon which Brown separated his *H. uncinata* from the *H. compressa*, is exceedingly variable. In the southern specimens generally it is long and very rigid on some of the glumes at least towards the upper end of the spike; in the common form figured by Brongniart it is small and only observable on a few glumes; most of the northern specimens have all the outer glumes fine-pointed without hooks. The latter form is also in East India and comes very near to, if it be not identical with, the south Mediterranean *H. fasciculata*, Kunth.

20. MANISURIS, Swartz.

Spikelets in pairs in the 1-sided notches of the articulate rhachis of a simple spike, 1 sessile and half embedded in a cavity on the rhachis with 1 hermaphrodite flower, the other on an appressed pedicel reduced to 2 empty glumes, the spike single on the peduncle above a sheathing bract. Glumes of the sessile spikelet 4, the outer one the largest, globular and hard, covering the cavity of the rhachis, the 2nd smaller, concave, thin but rigid, 3rd and 4th small thin and hyaline. Palea none (or very minute?). Styles distinct. Grain enclosed in the hard outer glumes, free from them.

The genus is now generally reduced to the single species, widely spread over the warmer regions of the New and the Old World.

1. **M. granularis,** *Sw.; Kunth, Enum.* i. 469.—A branching leafy annual of 1 ft. or more, sprinkled or villous with spreading hairs, the leaf-sheaths usually hispid, the floral leaves generally exceeding the enclosed sheathing bracts and spikes, and the narrow sheathing bracts on the separate peduncles as long as or longer than the spikes, the whole inflorescence forming an irregular leafy panicle. Spikes mostly about ½ in. long. Spikelets scarcely more than ½ line diameter, the prominent grain-like hard and pitted outer glumes alone conspicuous,

and appearing in a single row on one side of the rhachis.—Beauv. Agrost. t. 21, f. 10.

N. Australia. Depot and Sturt's Creek, *F. Mueller.*

21. OPHIURUS, Br.

Spikelets singly sessile and embedded in the alternate cavities of the articulate rhachis of a simple spike, with 1 hermaphrodite or female flower and often a male one below it, the spike single on each peduncle above a sheathing bract, and cylindrical or nearly so. Glumes 4, the outer one hard, closely covering the cavity of the rhachis, the 2nd thin but rather rigid, concave or keeled, the 3rd and 4th as well as the paleæ thin and hyaline, all awnless. Styles distinct. Grain enclosed in the glumes but free from them.

A small tropical Asiatic and African genus, the only Australian species extending also into East India. The genus only differs from *Rottboellia* in the want of the pedicellate barren spikelets.

1. **O. corymbosus,** *Gærtn.*; *Kunth, Enum.* i. 464.—Stems erect, branching, said to attain 5 or 6 ft. in height. Upper leaves few with long sheaths, quite glabrous in the typical form. Spikes rigid, 2 to 5 in. long and scarcely above 1 line diameter, pedunculate and clustered in the upper leaf-sheaths, but each peduncle with a long narrow sheathing bract below the spike. Outer glume lanceolate, 2 lines long, very hard, 5-nerved and pitted or tuberculate between the nerves, 2nd glume in the deep cavity very concave and keeled, 3rd enclosing a palea and male flower, 4th or terminal one with a hermaphrodite (or female?) flower.—*Rottboellia corymbosa,* Linn.; Roxb. Corom. Pl. t. 181.

N. Australia. Upper Victoria and Albert Rivers, *F. Mueller.*
Queensland. Endeavour River, *Banks and Solander*; Kennedy District, *Daintree*; Rockhampton, *O'Shanesy, Thozet*; Herbert's Creek, *Bowman.*

Widely spread over East India, also in tropical Africa.

Var? *pubescens.* A single small specimen, with an apparently annual root, from Hooker's Creek, *F. Mueller.* Leaves very pubescent. Spikes like the typical ones, but with the outer glume still more pitted and tuberculate. Perhaps a distinct species.

22. ROTTBOELLIA, Linn. f. partly.

Spikelets in pairs in the alternate notches of the articulate rhachis of a simple spike, 1 sessile and embedded in a cavity of the rhachis, with 1 hermaphrodite flower and sometimes a male one below it, the other on a closely appressed pedicel but often spreading, with a male or rarely hermaphrodite flower, or reduced to 1 or 2 empty glumes, the spike single on each peduncle above a sheathing bract and cylindrical or nearly so. Glumes in the sessile spikelet 4, the outer one coriaceous, closely covering the cavity of the rhachis, the 2nd thinner but often rigid, concave or keeled, the 3rd and 4th and the paleæ very thin and hyaline, all awnless. Styles distinct. Grain enclosed in the glumes but free from them.

The genus extends over tropical Asia and Africa with at least one American species. Of the four Australian ones, two have a wide range in tropical Asia, the other two are endemic.

Rottboellia was originally founded by the younger Linnæus on five species which are now separated into as many genera. Brown's proposal to restrict the name to the *R. exaltata* and allied species since added has now been generally adopted.

Stems scarcely branched, with single spikes of 2 to 3 in. the articles of the spike densely ciliate at the top. Sessile spikelet 1-flowered, the outer glume silky villous . . . . 1. *R. formosa.*
Stems usually branched. Peduncles solitary in the upper sheaths, with a spike of 3 to 6 in., quite glabrous. Sessile spikelet above 2 lines long, 2-flowered . . . 2. *R. exaltata.*
Stems branched. Peduncles clustered in the upper sheaths, the spikes slender, under 3 in., glabrous. Sessile spikelet under 2 lines long, 1-flowered.
  Outer glume of the sessile spikelet tuberculate at the base, the nerves scarcely winged at the top. Pedicellate spikelet barren . . . . 3. *R. muricata.*
  Outer glume of the sessile spikelet smooth, the 2 nerves distinctly winged at the top. Pedicellate spikelet often fertile . . . . 4. *R. ophiuroides.*

1. **R. formosa,** *R. Br. Prod.* 206.—Apparently annual. Stems scarcely branched, above 1 ft. long. Leaves narrow, more or less hirsute with spreading hairs. Peduncles solitary in the upper axils, bearing each a sheathing bract and a single cylindrical spike of 2 to 3 in., not 1½ lines diameter, the rhachis exceedingly fragile and each article crowned by a ring of dense, often purplish hairs. Outer glume of the fertile spikelet broad hard and obtuse, but densely covered with appressed hairs of which the upper ones are longer giving it an acute appearance; 2nd glume broad concave and thin, 3rd and 4th smaller, very thin and hyaline, no male flower in the 3rd, the 4th alone flowering, the palea minute or deficient. Barren spikelets sessile, of a single ovate or lanceolate 3- or 5-nerved glabrous glume, with sometimes a second smaller one in its axil.—Kunth, Revis. Gram. i. t. 91.

N. Australia. Islands of the North Coast, *R. Brown;* Depot Creek, Upper Victoria River, *F. Mueller;* North Coast of Arnhem's Land, *M'Kinlay.*

2. **R. exaltata,** *Linn. f. Suppl.* 114.—Stems stout, erect, attaining 6 to 10 ft. Leaves long and rather broad, scabrous, the sheaths more or less hispid. Peduncles solitary in the upper sheaths. Spikes often above 6 in. long, cylindrical, 2 lines diameter when old, the upper part often slender with abortive spikelets, the rhachis and spikelets perfectly glabrous. Outer glume of the fertile spikelets ovate, rather obtuse, slightly convex, about 2 lines long, coriaceous and smooth but with many nerves more visible inside than out; 2nd glume acute, deeply

immersed, 3rd and 4th thin and almost hyaline, both with perfect paleas, the 3rd with a male the 4th with a hermaphrodite flower. Pedicellate spikelets much flatter, rather smaller, with 2 male flowers or only a palea in the 3rd glume.—Kunth, Enum. i. 466, R. Br. Prod. 206; Roxb. Corom. Pl. t. 157.

N. Australia. Islands of the North Coast, *R. Brown.*

Very common in tropical Asia.

3. **R. muricata,** *Retz; Kunth, Enum.* i. 467.—Stems branching, 4 to 6 ft. high. Leaves rather broad, glabrous except a few cilia at the orifice of the sheaths, the margins scabrous. Spikes 1 to 2 in. long, very brittle, clustered in the upper axils on very unequal slender peduncles, with a close sheathing bract at the base of each. Spikelets about 2 lines long; outer glume of the sessile spikelet closely appressed, obtuse, slightly 2-winged at the end, coriaceous, bearing at the base a few tubercles either on each side or sometimes on the back, the spikelet containing only a single hermaphrodite flower. Pedicellate spikelet either including a male flower or reduced to empty glumes.—*R. glandulosa,* Trin. in Mem. Acad. Petersb. ser. 6, ii. 250; *Cœlorhachis muricata,* Brongn. in Duperr. Voy. Bot. 65, t. 14.

Queensland. Etheridge River, *Herb. F. Mueller.*

Also in the Malayan Peninsula and Archipelago.

4. **R. ophiuroides,** *Benth.*—A tall erect glabrous grass. Leaves long, often ½ in. broad, the upper ones with long sheaths passing into sheathing bracts. Peduncles crowded on the short erect branches of a large terminal leafy panicle, each branch within a sheathing bract, and a narrow sheathing bract on each peduncle. Spikes slender, simple, 2 to 3 in. long, quite glabrous and very brittle. Spikelets 1½ to 2 lines long, both the sessile and the pedicellate ones with a hermaphrodite flower, or the pedicellate with a male flower or reduced to empty glumes. Glumes all obtuse, awnless and smooth, the outer one with the marginal nerves, and the 2nd with the keel winged at the top as in *Ischæmum.*—*Ischæmum rottboellioides,* R. Br. Prod. 205; *Andropogon rottboellioides,* Steud. Syn. Glum. i. 382; F. Muell. Fragm. viii. 123 (excl. syn. Retz and Brongn.).

N. Australia. Gulf of Carpentaria, *R. Brown;* Victoria and Fitzmaurice Rivers, *F. Mueller;* Port Darwin, *Schultz, n.* 798.

Queensland. Rockingham Bay, *Dallachy;* Broad Sound, *Bowman.*

SUBTRIBE III. MAYADEÆ.—Spikelets unisexual, the males usually paniculate, the females spicate at the base of the males or in a separate inflorescence. Grain enclosed in a hard smooth case, which is either the pericarp or an outer glume or a subtending bract according to the genus.

This subtribe is to the Andropogoneæ what *Spinifex* and *Thuarea* are to the Paniceæ and includes amongst other non-Australian genera the well-known *Coix* and *Zea.*

23. CHIONACHNE, R. Br.

Spikelets monœcious, in simple spikes, the upper ones male and 2-flowered, the lower female and 1-flowered, the spikes solitary on peduncles bearing a sheathing bract under the spike. Male spikelets in pairs. Outer glume the largest, membranous and many-nerved, 2nd thinner with fewer nerves, 3rd and 4th thinner and hyaline, each enclosing a hyaline palea and 3 stamens. Female spikelets singly sessile in the notches of the rhachis, closely appressed and superposed in a single row or solitary. Outer glume very thick hard and smooth, completely enclosing the rest of the spikelet, and the thick margins embracing the rhachis, 2nd and 3rd glumes both empty, and 4th glume enclosing the ovary gradually narrower and thinner. Palea narrow, hyaline. No lodicules. Style single within the glume, divided beyond it into 2 long shortly feathery stigmas. Grain enclosed in the hard smooth outer glume but free from it, the rhachis of the spike at length articulate between each female spikelet.

A small genus, extending over tropical Asia. Of the two Australian species one is a common Indian one, the other apparently endemic though closely allied to one from the Indian Peninsula.

Peduncles several in the upper leaf-sheaths. Bracts spreading under the spike. Spike 1 in. or rather longer, with only 1 female spikelet	1. *C. barbata.*
Peduncles solitary in the leaf-sheaths, the bract closely embracing the base of the spike. Spike 3 to 4 in. long, with 3 to 6 female spikelets	2. *C. cyathopoda.*

1. **C. barbata,** *R. Br. in Benn. Pl. Jav. Rar.* 18. — An erect stout branching grass, attaining several feet, but said to be annual. Leaves flat, broad or narrow, very scabrous, the sheaths usually sprinkled with rigid spreading hairs. Nodes glabrous or bearded. Peduncles slender but rigid, usually several in the upper axils, very unequal in length but the longest shorter than the leaf, each bearing a broadly lanceolate acuminate bract at the base of the spike, usually about 1 in. long, at first close and sheathing but at length opening out. Spike scarcely exceeding the bract. Female spikelet solitary at the base, ovoid-oblong, nearly 4 lines long; males 6 to 10 in pairs, 4 to 5 lines long, narrow, rather acute. Rhachis of the spike articulate above and below the female spikelets, the peduncle dilated and cup-shaped under it.—*Coix barbata,* Roxb. Hort. Beng. 66 and Fl. Ind. iii. 569.

Queensland. Burdekin River, *Bowman;* Cardwell District, *Bailey* (*Herb. F. Mueller*).

Widely spread over East India and originally described as *Coix arundinacea,* Willd. Spec. Pl. iv. 203, but that specific name having been preoccupied by Lamarck, Brown and Bennett in transferring it to *Chionachne* took up Roxburgh's name of *barbata* entered into the Hortus Benghalensis (1814) as well as in several herbaria, though described only in the Flora Indica. Thwaites had since, Enum.

Ceyl. Pl. 357, substituted for it Sprengel's specific name *Königii*, published as *Coix Königii*, Spreng. Syst. i. 239, which addition however to the synonymy seems scarcely to be justified by the above data.

The Australian specimens are imperfect but quite sufficient to establish the identity with the Indian ones, which have helped to make out the above character. They were included by F. Mueller in his *Sclerachne cyathopoda.*

2. **C. cyathopoda,** *F. Muell.*—An erect grass of several feet, less branched than *C. barbata.* Leaves long and flat, scabrous on the upper surface, the sheaths either quite glabrous or sprinkled with rigid hairs arising from tubercles. Peduncles usually solitary within the leaf-sheaths, with a narrow sheathing bract shorter than the spike and remaining closed over its base. Spikes 3 to 4 in. long with 3 to 6 female spikelets at the base, exactly superposed in a single row and closely appressed, the hard shining outer glume 4 to 5 lines long and embracing the rhachis as in *C. barbata,* the female part of the spike usually included in the leaf-sheath even when ripe. Male spikelets numerous in the upper part of the spike, usually turned in pairs to one side, 4 to 6 lines long, the glumes varying from obtuse to acutely acuminate.—*Sclerachne cyathopoda,* F. Muell. Fragm. viii. 116.

N. Australia. Upper Victoria River, Hooker and Sturt's Creeks, *F. Mueller ;* Gulf of Carpentaria, *Landsborough.*

Queensland. Brisbane River, *Bailey ;* Dawson and Comet Rivers, *Leichhardt ;* Rockhampton and neighbourhood, *Bowman, Thozet, O'Shanesy.*

In inflorescence this species comes near to an unpublished East Indian one named by Munro in several herbaria, *C. Wightii,* but appears to be sufficiently distinct. It varies considerably in the length and acuteness of the male spikes, in the hairy or glabrous leaf-sheaths, etc., but the specimens are insufficient to establish any material distinctions. F. Mueller included among them those of the true *C. barbata.* The genus *Schlerachne* to which he refers both species was established on a scarce Japanese plant, only known from Horsfield's specimens, and differing in the form assumed by the fruiting glume, as well as in the relative numbers and position of the male and female spikelets.

SUBTRIBE IV. EUANDROPOGONEÆ.—Spikelets in pairs or in threes rarely solitary, in the notches or at the end of simple spikes or of the branches of a panicle, the rhachis usually but not always articulate at each notch, and not so deeply excavated as in Rottboellieæ, one spikelet sessile and fertile (hermaphrodite or female), the other one or two when present male or neuter, but sometimes rudimentary or wholly deficient. Flowering glume of the fertile spikelet usually bearing the awn characteristic of the tribe or reduced to that awn, which is deficient only in a very few species or varieties.

24. HETEROPOGON, Pers.

Spikelets 1-flowered, monœcious, in pairs in the notches of the articulate rhachis of a simple 1-sided spike, the females sessile, cylindrical, turned to one side of the spike, the males lanceolate, awnless, shortly pedicellate, imbricate on the other side of the spike. Glumes in the female spikelet 4, the outer one hard convolute, the 2nd keeled, the 3rd very thin and hyaline, 4th or terminal glume a hard twisted and bent awn, attenuate and flexuose or narrow and hyaline at the base as in *Andropogon*. Paleas very small and thin or none. Styles distinct. Grain enclosed in the hardened glumes but free from them.

A genus of several species, chiefly tropical, in the New as well as the Old World. Both the Australian species extend into tropical Asia, and one over the general area of the genus.

Spikes about 2 in. long; male spikelets 3 to 4 lines . . . 1. *H. contortus.*
Spikes 3 to 6 in. long; male spikelets ½ in. . . . . 2. *H. insignis.*

1. **H. contortus,** *Roem. et Schult. Syst.* ii. 386.—Stems ascending or erect, 1 to 2 ft. high. Leaves narrow, ciliate with a few long hairs, the sheaths flattened. Spikes pedunculate, 1 to 2 in. long without the awns. Male or barren spikelets 3 to 4 lines long, green, ciliate, closely imbricate in 2 rows along one side of the spike almost concealing the females. Female spikelets narrow, the outer glume hard, obtuse, convolute, the 2nd narrow with a hard centre, the hairs surrounding the spikelet brown and silky. Awn protruding often to 2 in. and very much twisted.—*Andropogon contortus*, Linn.; Kunth, Enum. i. 486; R. Br. Prod. 201; F. Muell. Fragm. viii. 120; *Heteropogon hirtus*, Pers. Syn. ii. 533; *Andropogon striatus*, R. Br. Prod. 201.

N. Australia. Islands of the North Coast, *R. Brown;* Victoria River, *Elsey;* Strangways River, *M'Douall Stuart;* Port Darwin, *Schultz. n.* 10, 146, 151; Sweers Island, *Henne,*

Queensland. Keppel Bay, *R. Brown;* Endeavour River, *Banks and Solander;* North-east Coast, *A. Cunningham;* Rockingham Bay, *Dallachy;* Moreton Bay, *F. Mueller, Bailey, Leichhardt;* Rockhampton, *O'Shanesy;* Springsure, *Wuth.*

N. S. Wales. Hastings and Clarence Rivers, *Bailey.*

Extends over tropical and sub-tropical Asia, Africa and America.

Andropogon tenuis, R. Br. Prod. 201, from Keppel Bay, appears to be only a smaller slender more glabrous variety or state of *H. contortus.*

2. **H. insignis,** *Thw. Enum. Ceyl. Pl.* 437.—A much more robust plant than *H. contortus*, said to attain from 8 to 10 ft. Leaves narrow, with flattened sheaths, glabrous or rarely sprinkled with long loose hairs. Spikes 3 to 6 in. long without the awns. Lower male or barren spikelets lanceolate, acute, about ½ in. long, the upper ones more acuminate and contracted at the base, often ¾ in. long. Outer glume glabrous, the 2nd with inflexed hyaline ciliate margins. Female spikelets 3 to 4 lines long, brown and pubescent on a short villous brown pedicel. Outer glume obtuse, the midrib thick and prominent, with a furrow on each side. Awn 3, 4 or even 5 in. long.—*Andropogon triticeus*, R. Br. Prod. 201; F. Muell. Fragm. viii. 120.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* Arnhem's Land, *M'Kinlay;* Port Darwin, *Schultz, n.* 30; Port Essington, *Armstrong;* Bountiful Island, *Henne.*

Queensland. East coast, *R. Brown;* Lord Howick's group, *F. Mueller;* Rockingham Bay, *Dallachy;* Rockhampton, *Bowman, Thozet, O'Shanesy.*

Also in Timor and Ceylon.

25. ISCHÆMUM, Linn.

(Spodiopogon, *Trin.* Meoschium, *Beauv.* Hologamium, *Nees.*)

Spikelets in pairs in the alternate notches of the articulate flexuose rhachis of simple spikes, 1 sessile with 1 hermaphrodite terminal flower and a male one below it, the other pedicellate and either similar or with only one hermaphrodite or one or two male flowers or reduced to empty glumes, the spikes either solitary or 2 or more, sessile or nearly so at the end of the common peduncle. Glumes in the sessile spikelet 4, the outer one the largest, awnless, truncate or 2-toothed at the top; 2nd glume keeled and sometimes produced into a short straight awn, 3rd glume rather smaller, thin, enclosing a palea and 3 stamens; terminal glume a twisted and bent awn, attenuate or hyaline and bifid at the base as in *Andropogon.* Palea small and thin or none. Styles distinct. Grain enclosed in the glumes but free from them.

The genus is chiefly Asiatic with a few tropical African and American species. F. Mueller follows Steudel in uniting it with *Andropogon*, whilst others divide it into almost as many genera as there are species.

Sessile spikelet 2-flowered, awnless. Pedicellate spikelet 1-flowered, awned. Outer glume membranous. Spikes 3 to 5 . . . . 1. *I. truncatiglumis.*
Spikelets both 2-flowered and awned. Outer glume rigid. Spikes 2 or 3, rarely 4, erect, often appressed so as to appear like 1 cylindrical spike.
Nodes glabrous. Stem tall erect . . . . 2. *I. arundinaceum.*
Nodes bearded. Stems 2 to 3 ft. high. Awn exserted.
Spikes 3 to 4 in., spikelets 4 to 5 lines long . . . 3. *I. triticeum.*
Spikes 1½ to 3 in., spikelets about 3 lines long . . 4. *I. australe.*
Nodes bearded. Stems creeping or diffuse, shortly ascending.
Glabrous. Rhachis of the spike not ciliate. Outer glume winged at the top. Awn concealed in the spikelet . . . . 5. *I. muticum.*
Leaves hairy. Rhachis of the spike ciliate. Outer glume wrinkled on the base. Awn shortly exserted . . . . 6. *I. ciliare.*
Sessile spikelet 2-flowered, awned. Pedicellate spikelet unawned, with a male or without any flower.
Spikes 2. Habit of *I. ciliare* . . . . 7. *I. decumbens.*
Spike solitary. Pedicellate spikelet without flowers.
Spike slender. Sessile spikelets flat, closely appressed, pectinate-ciliate on each side. No awn . . . . 8. *I. pectinatum.*
Spike rigid. Articles of the rhachis and pedicels ovate, convex, smooth and shining resembling sessile spikelets . . . . 9. *I. fragile.*
Spike solitary. Pedicellate spikelets lanceolate, flattened, with 2 male flowers . . . . 10. *I. laxum.*

1. **I. truncatiglumis,** *F. Muell. Herb.*—A glabrous erect grass of about 2 ft. or rather more, the nodes not bearded. Spikes 3 to 5, sessile and clustered at the end of a long peduncle, 1½ to 2½ in. long,

the rhachis glabrous, the pedicels ciliate with a few long hairs. Spikelets scarcely 2 lines long, the sessile one 2-flowered; outer glume rather broad and often shorter than the others, membranous, 5-nerved, truncate and toothed at the end, ciliate on each side with long hairs; 2nd glume thin, acute, slightly keeled, 3rd rather smaller but nearly similar, enclosing a palea and male flower, 4th glume under the hermaphrodite flower narrow, very thin and hyaline but scarcely smaller, entire and unawned. Pedicellate spikelet much narrower; outer glume 3-nerved, acute, with a few dorsal hairs, 2nd glume thin and very narrow, 3rd very thin and hyaline, empty, 4th under an apparently female flower reduced to the twisted awn of the genus, slightly dilated and ciliate at the base.

N. Australia. Arnhem's Land, *F. Mueller.* The aspect of the species is nearly that of the Asiatic genus *Apocopis*, but the characters rather those of *Ischæmum*.

2. **I. arundinaceum,** *F. Muell. Herb.*—Stems very erect, several feet high, quite glabrous, the nodes not bearded. Leaves long, mostly erect, glabrous except a few cilia at the orifice of the sheaths, the ligula short. Spikes 2 to 4 in. long, 2 together as in *I. australe* and the structure the same, but the spikelets narrower, mostly about 3 lines long.

N. Australia. Roper River, *F. Mueller;* Port Darwin, *Schultz, n.* 30, 182, 815.

This and the three following species, united into one by F. Muell. Fragm. viii. 121, are very nearly allied to each other, but, as far as our specimens go, appear to be constantly distinct.

3. **I. triticeum,** *R. Br. Prod.* 205.—Very near *I. muticum*, but a coarse plant, ascending to 2 or 3 ft. Leaves mostly long and broad, contracted at the base or scarcely cordate, glabrous or the lower sheaths hairy. Spikes 2 together, 3 to 4 in. long. Spikelets 4 to 5 lines long, more acuminate than in *I. muticum.* Outer glume smooth and shining at the base, several-nerved and often ciliate with a few hairs at the end, the wings of the lateral nerves often unequal; inner glumes rather rigid, the 3rd with a rigid palea and male flower, the 4th under the terminal flower more hyaline, shortly 2-fid, the awn usually exserted and sometimes ½ in. long. Pedicellate spikelet nearly similar, but as in *I. muticum* rather narrower, the wings and nerves irregular, and the awn often shorter. — *Andropogon triticiformis*, Steud. Syn. Glum. i. 376.

Queensland. Keppel and Shoalwater Bays and Broad Sound, *R. Brown;* Endeavour River, *A. Cunningham;* Cape York and Port Curtis, *M'Gillivray;* Moreton Bay, *F. Mueller.*
N. S. Wales. Clarence River, *Wilcox.*

4. **I. australe,** *R. Br. Prod.* 205.—Stems from a shortly decumbent base or creeping rhizome erect, 2 to 3 ft. high, but not stout. Leaves rather narrow, glabrous or slightly hairy in the typical form, the nodes always bearded, the upper sheaths very long. Spikes 2 together on a

long peduncle, sessile and erect, 1¼ to 3 in. long, the rhachis and pedicels slightly ciliate. Spikelets 3 lines long or scarcely more; otherwise the same as in *I. triticeum.* Awn of the sessile spikelet ¼ to ½ in. long, of the pedicellate spikelet shorter or reduced to a short point.—*Andropogon cryptatherus*, Steud. Syn. Glum. i. 376.

N. Australia. Near Sea Range, *F. Mueller.*

Queensland. Brisbane River, Moreton Bay, *F. Mueller*, *C. Stuart*; also in *Bidwill's* collection.

N. S. Wales. Port Jackson, *R. Brown;* Macleay River, *Beckler.*

Var. *villosum.* Leaves more hairy and very scabrous. Rhachis and pedicels of the spikes densely ciliate with long hairs and the spikes often above 3 in. long. *I. villosum*, R. Br. Prod. 205; *Andropogon villiferus*, Steud. Syn. Glum. i. 376.—North Coast, *R. Brown;* Goold Island, *M'Gillivray;* Mount Wheeler, *Thozet.*

5. **I. muticum,** *Linn; Kunth, Enum.* i. 512.—Stems diffuse or creeping at the base, ascending to from 6 in. to above 1 ft., rather stout and leafy to the inflorescence. Leaves lanceolate, rather short, often cordate at the base, quite glabrous, the upper one reduced to a sheathing bract very near or close to the spikes. Spikes 2 together but sessile erect and closely appressed so as to appear like one thick cylindrical spike of 1 to 2 in., the rhachis and thick pedicels quite glabrous. Spikelets about 3 lines long. Outer glume of the sessile one paleaceous, broad, obtuse acute or mucronate, several-nerved, the 2 lateral nerves winged towards the top, 2nd glume narrower thinner, acute, the keel winged towards the end, 3rd thin but rigid and acute, with a male flower, the 4th under the hermaphrodite flower thin and hyaline, entire and awnless or slightly notched with a minute awn. Pedicellate spikelet narrower but containing a hermaphrodite flower in the specimens examined.—*Andropogon muticus*, Steud. Syn. Glum i. 374; F. Muell. Fragm. viii. 120 partly.

Queensland. Rockingham Bay, *Dallachy.*

Widely spread on the sea-coasts of tropical Asia and the South Pacific Islands.

6. **I. ciliare,** *Retz, Obs.* vi. 36 (*not of Kunth*) *var. ?* podostachyum.—Stem in the specimen seen slender, under 1 ft. high, erect from a shortly decumbent or creeping base. Leaves short, glabrous, the ligula prominent. Nodes bearded. Spikes scarcely 1 in. long, 2 at the end of the peduncle, but one of them shorter and attached lower down, giving the other a pedunculate appearance. Pedicels ciliate. Sessile spikelet 3 lines long, the outer glume lanceolate, acutely acuminate, the nerves more conspicuous and not so smooth as in the typical *I. ciliare* and in *I. decumbens;* 2nd glume as long but thinner narrow and keeled, 3rd nearly as long, very acute, with a male flower, 4th or terminal glume hyaline, deeply 2-lobed with a slender awn not twice as long, enclosing the hermaphrodite flower. Pedicellate spikelet nearly similar, but containing only a male flower and no awn.

N. S. Wales. Hunter's River, *United States Exploring Expedition.*

This is most probably a distinct species, but having seen only a single specimen, I doubt whether the peculiar inflorescence may not be accidentally abnormal. The typical *I. ciliare*, Retz, (*Spodiopogon obliquivalvis*, Nees in Pl. Meyen. 185; *Andropogon malacophyllus*, Steud. Syn. Glum. i. 372,) is common in East India; besides the 2 spikes being sessile from the same point, it has the outer glume shorter, broader and more coriaceous than in our plant, and the pedicellate spikelet is awned and 2-flowered like the sessile one. By an unfortunate oversight, Kunth mistook the *Arthraxon ciliare*, Beauv., for Retz's *Ischæmum ciliare*, although Beauvois had expressly pointed out the generic difference of the two plants.

7. **I. decumbens,** *Benth.*—A weak decumbent plant with the habit of *I. ciliare*, the stems ascending to about 1 ft. in the specimens seen, the nodes bearded. Leaves rather short, chiefly at the base of the stem, more or less hairy, the upper ones few and short with long sheaths. Spikes 2 together, both sessile and erect, 1 to 1½ in. long, the rhachis and pedicels shortly ciliate. Sessile spikelet 2½ to 3 lines long, the outer glume ovate-lanceolate, rigid, smooth and shining, the nerves visible only towards the end, the 2 lateral ones produced into short points but not winged, 2nd glume keeled and pointed but not winged, 3rd acute, with a male flower, 4th under the hermaphrodite flower hyaline but not so thin as in some species, bifid, with a fine awn often ⅓ in. long. Pedicellate spikelet reduced to a single narrow empty glume.

N. Australia. Port Darwin, *Schultz*, *n.* 126. F. Mueller, Fragm. viii. 119, refers this to the Indian *I. ciliare*, Retz, (*Andropogon malacophyllus*, Steud.), which it resembles at first sight, but from which it is distinctly separated, if the reduction of the pedicellate spikelet, the shape of the glumes, etc., prove as constant as they appear to be in our specimens.

8. **I. pectinatum,** *Trin. in Mem. Acad. Petersb. ser.* 6. ii. 296.—Stems tufted and leafy at the base, about 1 ft. high or rather more. Lower leaves narrow, flat, under 6 in. long, those on the stem few, reduced to long close sheaths with very short erect laminæ. Spike single, pedunculate above the last sheath, rather slender, straight or slightly curved, usually about 2 in. but sometimes twice that length. Sessile spikelets closely appressed and imbricate on one side of the rhachis, much flattened, 2 lines long or rather more. Outer glume broad, truncate or retuse, thin but rigid, 7-nerved, the outer nerves close to the margin elegantly pectinate-muricate in the lower part, and produced upwards into short wings; 2nd glume narrower, acute, keeled, 3rd glume thin and hyaline with a palea and male flower, terminal glume with a hermaphrodite flower shorter, rather broad, obtuse, very thin and hyaline, with a faint central nerve but no awn, the palea similar but without the central nerve. Pedicellate spikelet reduced to a single few-nerved acuminate glume, slightly spreading.—*Andropogon falcatus*, Steud. Syn. Glum. i. 369; F. Muell. Fragm. viii. 118.

Queensland. Brisbane River, Moreton Bay, *C. Stuart*, *Bailey*; Rockhampton and neighbourhood, *Bowman* and others; Darling Downs, *Law*; Mackenzie River and other stations, *Leichhardt.*

Also in Ceylon and the Indian Peninsula.

9. **I. fragile,** *R. Br. Prod.* 205.—Stems slender, ascending or erect, 1½ to 2 ft. high. Leaves narrow, those on the stem with long and loose sheaths, the uppermost sheath close and slender. Spike single, about 1½ in. long, rigid, on a long peduncle. Articles of the rhachis and pedicels of the barren spikelets similar to each other, about as long as the fertile sessile spikelet, ovate-turgid almost hemispherical, hard and shining outside, the inner cavity closed by a thin membrane, the two assuming the appearance of two collateral spikelets, the fertile spikelet sessile between them on the other side of the rhachis, about 2 lines long, with a tuft of brown cilia at its base. Outer glume broad, rigid, faintly 5-nerved, notched at the end, with 2 prominent membranous wings, 2nd glume keeled and tapering to a fine point or very short awn, 3rd thin, almost hyaline with a palea as long and not thinner and 3 stamens, 4th terminal glume very thin and hyaline, bifid; the awn twice or three times as long as the spikelet. Pedicellate spikelet smaller, reduced to two membranous glumes, the outer one broad and rather obtuse, the inner narrow, tapering to a point.

Queensland. Endeavour River, *Banks and Solander*.

10. **I. laxum,** *R. Br. Prod.* 205.—A rather slender grass of 2 to 3 ft., the Australian specimens quite glabrous. Leaves narrow, often subulate, the ligula short, ciliate. Spike single, dense, sometimes slightly curved, 2 to 4 or rarely 5 in. long; rhachis and pedicels ciliate. Sessile spikelet narrow, scarcely flattened, 3 to 4 lines long; outer glume acutely acuminate, with 2 rather prominent nerves and obscure ones between them; 2nd glume thin, produced into a long fine straight awn; 3rd hyaline, with a male flower; terminal glume hyaline, narrow, bifid, with a long bent awn. Pedicellate spikelet more conspicuous, much flattened as well as the pedicel. Glumes acutely acuminate, the outer one broadly lanceolate, with 5 very prominent nerves, the 2nd thin, scarious, faintly 3-nerved, two flowering glumes and paleas thin and hyaline, both with male flowers or the 3rd empty.—*Andropogon nervosus*, Rottb.; Kunth, Enum. i. 507; *Hologamium nervosum*, Nees in Edinb. N. Phil. Journ. xviii. 185.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; main land of the gulf, *Landsborough*; Victoria River, *F. Mueller*; Port Darwin, *Schultz*, *n.* 10; Arnhem's Land, *M'Kinlay*.

Queensland. Peak Downs, *Burkitt*; Rockhampton and neighbourhood, *Bowman*, *Thozet*, *O'Shanesy*; also in *Leichhardt's* collection.

The species extends over tropical Asia and Africa.

26. DIMERIA, R. Br.

Spikelets 1-flowered, almost sessile, inserted singly on the alternate notches of slender unilateral spikes, which are either solitary or more frequently 2 or 3 together on a terminal peduncle; the rhachis not articulate, and frequently a tuft of short hairs under each spikelet.

Glumes 4, 2 outer empty ones linear, rigid, keeled, not awned, the 3rd also empty but smaller, thin and hyaline; terminal glume thin and transparent, entire or 2-lobed, with a slender awn either terminal or in the terminal notch, twisted at the base and bent back at or below the middle. Palea minute or none. Styles distinct. Grain free, narrow, enclosed in the outer glumes.

A small genus extending over tropical Asia. Of the two Australian species one is also in East India, the other appears to be endemic.

Spikelets nearly 2 lines long, with a tuft of hairs at the base. Outer glumes rather thick. (Stamens 3 ?) . . 1. *D. acinaciformis.*
Spikelets about 1 line long, without any or only a very minute tuft of hairs. Outer glumes thin. Stamens 2 . 2. *D. tenera.*

1. **D. acinaciformis,** *R. Br. Prod.* 204.—A slender annual, branching at the base, with filiform stems 6 in. to 1 ft. high. Leaves few near the base, narrow, ciliate with a few long hairs. Spikes 2, flat, the filiform flexuose rhachis 1 to 1½ in. long. Spikelets narrow-linear, nearly 2 lines long, with a prominent tuft of white hairs or cilia at their base. Outer glume rather thick, complicate, not bordered, the keel minutely serrate-ciliolate; 2nd glume rather longer, nearly as thick but bordered by a thin hyaline margin, the keel more prominent at the end. Terminal flowering glume very narrow and hyaline, shortly 2-lobed, distinctly keeled, the keel produced into a capillary twisted and bent awn of about ½ in. Stamens 3 (*R. Brown*), all fallen away from the spikelets examined.

Queensland. Endeavour River, *Banks and Solander.*

2. **D. tenera,** *Trin. in Mem. Acad. Petersb. ser.* 6, ii. 225.—A slender branching annual, with filiform stems 6 in. to 1 ft. high, erect or weak and decumbent. Leaves narrow, ciliate, the sheaths sprinkled with long spreading hairs, the ligula short, truncate. Spikes 2, filiform, 1 to 1½ in. long. Spikelets about 1 line long, very narrow, without any or rarely an exceedingly minute tuft of hairs at the base. Glumes thinner than in *D. acinaciformis*, the outer one usually sprinkled with a few hairs and the 2nd shortly ciliate on the hyaline margins, the 3rd very small or perhaps sometimes deficient. Terminal flowering glume rather shorter than the outer ones, scarcely notched, the awn appearing quite terminal.—*D. psilobasis,* F. Muell. Fragm. vii. 104.

N. Australia. Port Darwin, *Schultz, n.* 321.

Widely spread over East India, from the Peninsula to Nepaul and Mergui.

27. ARTHRAXON, Beauv.

(Batratherum, *Nees.*)

Spikelets 1-flowered, sessile in the alternate notches of the articulate rhachis of simple spikes, with a short pedicel in the same notch usually without any spikelet, the spikes sessile or shortly pedunculate in a simple terminal panicle. Glumes 4, the outer one the largest, membranous, several-nerved, the 2nd keeled, acute, the 3rd smaller, hyaline, all awnless, 4th or terminal glume shorter than the 2nd, hyaline but keeled, with a dorsal awn arising from the base but twisted and bent as in *Andropogon.* Palea very small and hyaline. Styles distinct. Grain enclosed in the outer glumes but free from them.—Stems usually weak or slender with short broad leaves.

The genus is generally spread over tropical Asia and Africa, the only Australian species apparently a slight variety of a common Indian one.

1. **A. ciliare,** *Beauv. Agrostogr.* 111, *t.* 11, *f.* 6, *var.* australe.—Stems slender, decumbent or creeping at the base, branching and ascending to about 1 ft. Leaves ovate-lanceolate, acute, 1 to 1½ in. long, cordate at the base, the sheaths usually ciliate with long hairs. Spikes usually 3 or 4, shortly pedicellate, forming a little simple panicle of about 1 in., the rhachis and abortive pedicels glabrous. Spikelets few, rarely above 6 in. each branch or spike about 2 lines long. Outer glume acute, with about 7 equally prominent more or less muricate nerves; keel of the 2nd glume ciliate towards the top; terminal or flowering glume obtuse, entire or very shortly 2-lobed, the dorsal awn proceeding quite from the base, fine and about twice as long as the spikelet.—*Batratherum echinatum*, Nees. in Edinb. New Phil. Journ. xviii. 181; *Andropogon echinatus*, Heyne in Steud. Syn. Glum. i. 38?

N. S. Wales. New England, *C. Stuart.*

Although evidently belonging to a common Asiatic species, these specimens do not precisely agree with the Indian forms. They are nearest to those named by Nees *Batratherum submuticum*, but never published by him under that name, though afterwards included in Steud. Syn. Glum. i. 382 as *Andropogon submuticus.* There are also several other Asiatic or African species nearly allied to it but apparently distinct. Amongst the numerous synonyms, however, cited by F. Muell. Fragm. viii. 119, there are several which belong to a very different plant, the *Ischæmum ciliare*, Retz, which, as above mentioned, Kunth had confounded with the *Arthraxon ciliare.*

Var. ? *tenellus.* A single specimen from Tawomba, in Queensland, *Bailey*, consisting of numerous adventitious stems from the base of an old one, with small narrow leaves and the panicles reduced to single spikes of 1 to 5 spikelets, the nerves of the outer glumes much muricate, the awn very short or obsolete. Perhaps an abnormal state rather than a variety, but the habit very peculiar.

28. POLLINIA, Trin. not of Spreng.

Spikelets 1-flowered, in pairs in the alternate notches of the articulate rhachis of simple spikes, one sessile or shortly pedicellate, the other on a longer pedicel, but the two otherwise similar, the spikes sessile and clustered or rarely solitary at the end of the common peduncle. Glumes 4 or 3, outer one the largest, membranous, awnless with a truncate toothed or ciliate tip, 2nd usually thinner, keeled, acute or produced into a fine straight awn, 3rd thin and hyaline or deficient; terminal or 4th glume a twisted and bent awn, contracted and flexuose or hyaline, dilated and 2-lobed at the base as in *Andropogon*. Palea small and hyaline or none. Styles distinct. Grain enclosed in the outer glumes and free from them.—Habit of *Andropogon*, sect. *Gymnandropogon*, the spikes silky-villous, rufous or silvery-white as in *A. sericeus* and its allies, but the pedicellate spikelets are all except sometimes at the base of the spike fertile, which is never the case in *Andropogon*.

The genus extends over tropical Asia and Africa, and of the five Australian species only one appears to be endemic.

Third glume very small and hyaline or none. Awn contracted at the base into a narrow flexuose stipes.
Spikes several, often numerous. Spikelets both pedicellate, 2nd glume with a fine straight awn. Awn of the terminal glume long.
Annual. Spikes 1½ to 2 in. long . . . . 1. *P. articulata.*
Perennial. Spikes 3 to 5 in. long . . . . 2. *P. irritans.*
Spikes 2 or 3. Spikelet sessile; 2nd glume not awned. Awn of the terminal glume short and fine . . . . 3. *P. fulva.*
Third glume not much shorter than the 2nd, thin and hyaline. Awn with a narrow hyaline 2-lobed dilatation at the base.
Spikes 3 to 4 in., spikelets 1½ lines, awns scarcely ½ in. long . . . . 4. *P. tristachya.*
Spikes about 5 in., spikelets nearly 3 lines, awn 1 to 1½ in. long . . . . 5. *P. Mackinlayi.*

1. **P. articulata,** *Trin. in Mem. Acad. Petersb. ser.* 6, iii. 90.—Closely allied to *P. irritans*, but smaller and more slender and apparently annual, 6 in. to 1½ ft. high. Leaves very narrow, flat or filiform. Spikes usually several, sometimes numerous, slender, 1½ to 2 in. long, the rhachis articulate but not breaking so readily as in some species. Spikelets exceedingly deciduous, under 1 line long, both pedicellate but one pedicel longer than the other, the rhachis and pedicels shortly ciliate. Outer glume obtuse, rather broad, faintly nerved, ciliate, 2nd glume rather narrow, obtuse but the keel produced into a fine straight awn; 3rd glume deficient (or very minute?). Awn or 4th glume contracted at the base into a flexuose stipes without any hyaline dilatation, ciliate in the lower twisted part, attaining 2 in. in the larger specimens. No palea.—*Erianthus articulatus*, F. Muell. Fragm. viii. 118; *Pogonatherum contortum*, Brongn. in Duperr. Voy. Bot. 90, t. 17.

N. Australia. Port Essington, *Armstrong;* Port Darwin, *Schultz, n.* 146.

Var. *minor*. Spikes 2 to 4, scarcely above 1 in. long.

Queensland. Rockingham Bay, *Dallachy.*

The species is also in the Malayan Archipelago.

2. **P. irritans,** *Benth.*—Stems 2 ft. high or more. Leaves usually

long and narrow, glabrous as well as the nodes. Spikes several usually numerous, 3 to 5 in. long, in a terminal cluster with a very short common rhachis, the slender rhachis of the spikes as well as the pedicels shortly ciliate. Spikelets both pedicellate but one pedicel longer than the other, about 1 line long. Outer glume rather broad, obtuse and more or less toothed at the end, the nerves faint except a more prominent one near each margin; 2nd glume narrow, the keel produced into a fine straight awn, 3rd very small and hyaline. Awn or terminal glume about 2 in. long, contracted at the base into a flexuose stipes without any hyaline dilatation, twisted and ciliate in the lower half. No palea.—*Saccharum irritans*, R. Br. Prod. 203; *Erianthus irritans*, Kunth, Enum. i. 479; F. Muell. Fragm. viii. 118.

Queensland. Keppel Bay, *R. Brown;* Endeavour River and Cleveland Bay, *A. Cunningham;* Cape York, *Daemel;* Rockingham Bay, *Dallachy.*

Var.? *myriantha.* Spikes about 20 in the cluster. Spikelets very numerous and small, with shorter and finer awns, but not otherwise different from the typical form.

N. Australia. Arnhem's Land, *M'Kinlay.*

3. **P. fulva,** *Benth.*—Stems either slender and 1 to 1½ ft. high, or stouter more branching at the base and attaining 2 to 4 ft., the nodes glabrous or shortly bearded. Leaves rather narrow tapering to fine points, the orifice of the sheaths and ligula usually ciliate and sometimes the sheaths hairy. Spikes 2 or 3 sessile and near together in a terminal cluster but not quite digitate, 1½ to 2½ in. long, covered with silky hairs of a rich brown. Spikelets mostly about 2 lines long, but variable in size, all similar or the pedicellate ones rather narrower. Outer glume truncate or denticulate at the end, faintly nerved, 2nd nearly as long, narrower, slightly keeled, truncate, 3rd very minute or more frequently entirely deficient. Awn or terminal glume slender, rarely ½ in. long, contracted into a flexuose stipes or slightly dilated at the base, hyaline and bifid. Styles very shortly united.—*Saccharum fulvum*, R. Br. Prod. 203; *Erianthus fulvus*, Kunth, Enum. i. 479; F. Muell. Fragm. viii. 118.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* Dampier's Archipelago, *A. Cunningham;* Port Darwin, *Schultz, n.* 466.

Queensland. Shoalwater, *R. Brown;* Rockhampton, *O'Shanesy*, and various localities in South Queensland, *Leichhardt* and many others.

N. S. Wales. Liverpool Plains, *C. Moore;* Darling River to Coopers' Creek, *Neilson.*

S. Australia. On the Murray near Morunda, *F. Mueller;* near Lake Eyre, *Andrews;* Lake Amadeus and Charlotte Waters Central Australia, *Giles.* Several of the latter specimens with the base of the awn rather more conspicuous hyaline and bifid, but still very narrow.

W. Australia, Murchison River, *Oldfield.*

This species at first sight much resembles the East Indian *Erianthus aureus*, Nees, (including *Pollinia Cumingii*, Nees, or *Erianthus Cumingii*, F. Muell. and other synonyms), but that has the outer glumes differently shaped and the inner ones much more developed.

4. **P. tristachya,** *Thw. Enum. Ceyl. Pl.* 368.—Stems 2 to 3 ft. high or sometimes more, the nodes not bearded. Leaves narrow, often sprinkled with a few long hairs and ciliate at the orifice of the sheaths. Spikes usually more than 3 and sometimes many, clustered at the end of the peduncle, 3 to 4 in. long, slender, the silky hairs of the rhachis and pedicels shorter than the spikelets. Spikelets about 1½ lines long, the sessile and pedicellate ones similar. Outer glume membranous, truncate or 2-toothed, faintly nerved, bordered by long cilia, 2nd narrower, scarcely ciliate, 3rd nearly as long, almost acute. Awn or terminal glume fine, scarcely ½ in. long, the hyaline base very narrow with small narrow terminal lobes.—*Erianthus Roxburghii,* F. Muell. Fragm. viii. 117.

Queensland. Rockingham Bay, *Dallachy.*

Common in East India, our specimens agreeing precisely with some from Ceylon and others from Khasya, etc.

5. **P. Mackinlayi,** *F. Muell. Herb.*—Apparently tall, but the lower part of the plant not seen, the upper leaf erect, with a long sheath slightly pubescent. Spikes 4 or 5, scarcely out of the sheath in the specimens seen, about 5 in. long, the spikelets almost concealed under the long silvery-silky hairs of the rhachis and pedicels. Spikelets nearly 3 lines long, the sessile and pedicellate ones similar. Outer glume membranous, scarcely nerved but thickened in the centre, densely ciliate in the middle with long hairs but glabrous above them, the 2nd narrower and thinner, the margins slightly ciliate, 3rd hyaline but not much shorter. Awn or terminal glume 1 to 1¼ in. long, the hyaline base with narrow acute lobes.—*Erianthus villosus,* F. Muell. Fragm. viii. 118.

N. Australia. North Coast of Arnhem's Land, *M'Kinlay.*

The East Indian *P. villosa,* Munro, differs in the fewer less silky spikes, the smaller spikelets with the outer glume much more rigid and prominently nerved without the dense dorsal cilia, and the awns much shorter.

29. ANDROPOGON, Linn.

(Gymnandropogon, Cymbopogon *and* Schizachyrium, *Nees.*)

Spikelets 1-flowered or empty, in pairs in the alternate notches of the articulate rhachis of simple spikes, 1 sessile hermaphrodite (or rarely female ?) and fertile the other pedicellate and barren either male or empty, the spikes either solitary or clustered and sessile or very shortly pedunculate at the end of the common peduncle. Glumes in the fertile spikelet 4, the outer one the largest, awnless, several-nerved, but often 2 nerves near the margin much more prominent than the others; 2nd glume keeled, rarely produced into a short straight awn, 3rd much smaller, very thin and hyaline, always empty, 4th or terminal glume under the flower very slender flexuose and stipes-like at the base or if dilated very thin and hyaline, entire or bifid at the top, with an awn either terminal or from the notch, rigid and twisted in the lower part, bent back and very fine above the middle. Palea small and hyaline or none. Glumes of the barren spikelets 4 or fewer, the outer one the largest and many-nerved, the 2nd keeled, the 3rd and 4th when present small thin and hyaline, all awnless. Styles distinct. Grain enclosed in the glumes but free from them.—Grasses usually tall and often scented, simple or paniculately branched.

A large genus, generally spread over the warmer regions of the globe, with a few extratropical species both in the northern and southern hemispheres. Of the fifteen Australian species three are widely spread over the warmer regions of the Old World, one of them extending into Europe, a fourth is at least in New Caledonia and the Philippines, the remainder are chiefly if not entirely endemic. It is not improbable however that when the Asiatic species come to be more carefully worked up some others may be found to be too closely connected with Australian ones if not absolutely identical.

SECTION I. **Gymnandropogon.**—*Spikes* 2, 3 *or more, clustered at the end of a peduncle without sheathing bracts, very rarely reduced to a single spike.*

Spikelets concealed or nearly so under copious long silky hairs.
  Spikes about 3 in., spikelets about 3 lines long . . . . 1. *A. erianthoides.*
  Spikes not above 2 in., spikelets scarcely 2 lines long.
    Long silky hairs on the back of the outer glumes as well as on the rhachis and pedicels . . . . 2. *A. sericeus.*
    Long silky hairs only or chiefly on the rhachis and pedicels.
      Glumes not pitted . . . . 3. *A. affinis.*
      Outer glumes marked with a pit on the back . . . 4. *A. pertusus.*
Spikes silky-hairy, but the hairs not covering the spikelets.
  Spikes 3 or 4 in a close cluster. Outer glumes obtuse or toothed . . . . 5. *A. annulatus.*
  Spikes 4 to 8 in a close cluster. Outer glumes acute . . . . 6. *A. Ischæmum.*
  Spikes numerous, the common axis elongated . . . . 7. *A. intermedius.*

SECTION II. **Cymbopogon.** *Spikes* 2 *together on each peduncle within or above a sheathing bract.*

Spikes both sessile at the end of the peduncle. Awns slender short and glabrous or deficient.
  Silky hairs long, concealing the spikelets or nearly so.
    Spikes erect. Awns prominent.
      Leaves long and broad. Stems tall and stout . . . . 8. *A. procerus.*
      Leaves flat, narrow. Spikes densely woolly . . . 9. *A. lanatus.*
      Leaves wholly subulate or very narrow, tapering into long subulate points. Spikelets small . . 10. *A. exaltatus.*
    Spikes at length spreading or reflexed. Awns none or very fine and scarcely projecting . . . . 11. *A. bombycinus.*

Hairs much shorter than the spikelets. Spikes divaricate usually shortly awned . . . . 12. *A. schœnanthus.*
Hairs minute. Spikes soon reflexed. Awns very short or none . . . . 13. *A. refractus.*
One spike affixed lower down than the other, slightly hairy. Awns 1 to 3 in. long, hairy in the lower part . . . 14. *A. lachnatherus.*

SECTION III. **Schizachyrium.**—*Peduncles axillary or terminal, bearing each a single spike above a narrow sheathing bract.*

Rhachis and pedicels shortly ciliate, a small oblique bract at each notch . . . . 15. *A. fragilis.*

SECTION I. GYMNANDROPOGON.—Spikes 2, 3 or more, clustered at the end of an elongated peduncle without sheathing bracts, very rarely reduced to a single spike.

Among the following species those with densely silky-hairy spikes approach *Pollinia* in habit, but the pedicellate spikelet is always barren and awnless, and most frequently without even a male flower.

1. **A. erianthoides,** *F. Muell. Fragm.* x. 75.—An erect glaucous grass of 2 or 3 ft., glabrous except the inflorescence, the nodes not bearded. Leaves rather narrow. Spikes usually 3 or 4, nearly sessile at the end of a peduncle without sheathing bracts, erect or scarcely spreading, about 3 in. long, the spikelets concealed under the very copious long silky hairs surrounding the sessile spikelet on the pedicels and a few on the outer glumes. Sessile spikelet about 3 lines long, the outer glume nearly equally many-nerved, with a short scarious often notched tip; 2nd glume rather shorter, keeled, 3-nerved, acute, 3rd thin and hyaline; awn or terminal glume fine, not above twice the length of the spikelet, contracted at the base into a flexuose stipes, with sometimes a very slight hyaline dilatation. Pedicellate spikelet reduced to 1 or 2 empty glumes.

Queensland. Peak Downs, *F. Mueller;* Darling Downs, *Leichhardt;* Springsure, *Wuth.*
N. S. Wales. Maneroo, *Woolls.*

2. **A. sericeus,** *R. Br. Prod.* 201.—Stems erect, branching at the base, usually rather slender and 1 to 2 ft. high, with narrow leaves chiefly at the base, but sometimes twice that height with larger leaves, the nodes bearded. Spikes in the typical form 2 or 3 or rarely twice as many, sessile at the top of a slender peduncle without sheathing bracts, all 1 to 2 in. long and densely clothed with long silky hairs on the outer glumes as well as on the rhachis and pedicels. Spikelets scarcely 2 lines long, the pedicellate one reduced to a many-nerved silky-hairy glume enclosing a second small hyaline lanceolate one. Outer glume of the sessile spikelet rather rigid, obtuse or nearly so, about 5-nerved, with long silky hairs on the back and a short scarious ciliate tip; 2nd glume keeled, acute, glabrous; 3rd very small broad thin and hyaline; awn or terminal glume ¾ to 1½ in. long, without any hyaline dilatation at the base.—*A. chrysatherus,* F. Muell. in Linnæa,

xxv. 443; *A. annulatus*, F. Muell. Fragm. viii. 123, but not of Forsk.

Queensland. Keppel Bay, *R. Brown*; Cape York, *Daemel*; Port Curtis, *M'Gillivray*; Moreton Bay, *A. Cunningham*, *F. Mueller* and others; Condamine River, etc., *Leichhardt*; Rockhampton and other localities in South Queensland, *O'Shanesy* and others.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls* and others; New England, *C. Stuart*; Macleay River, *Beckler*; Liverpool Plains, *C. Moore*; near Bathurst, *A. Cunningham*; between the Darling and the Western frontier, *Dallachy* and others.

S. Australia. Rocky Creek and Crystal Brook, *F. Mueller*; Lake Eyre, *Andrews*; Lake Amadeus, *Giles*.

W. Australia, *Drummond*, *n.* 986.

Also in New Caledonia and the Philippines.

Var. *polystachyus*. Usually a larger plant with 10 to 30 or even more spikes of 1½ to 2 in., all closely sessile in a terminal head, the long silky hairs and structure of the spikelets precisely as in the typical form.

N. Australia. Victoria River and Sturt's Creek, *F. Mueller*; Albert River and Sweers Island, *Henne*; Escape Cliffs, *Hulse*.

Queensland. Port Denison, *Fitzalan*; Burdekin River, *Bowman*; Rockhampton, *O'Shanesy*.

3. **A. affinis,** *R. Br. Prod.* 201.—Very near *A. sericeus* and perhaps a variety, with the same habit, the nodes less bearded and sometimes quite glabrous. Spikes usually 3 or 4, not quite sessile, 1½ to 2 in. long, the spikelets rather longer and narrower than in *A. sericeus* and not so closely imbricate, the long silky spreading hairs only on the pedicels and at the base of the sessile spikelets, not on the backs of the glumes, the 3rd glume more developed in the spikelets examined; the awn ¾ to 1¼ in long.

Queensland. Keppel Bay, *R. Brown*; Moreton Bay, *Leichhardt*, *C. Stuart*, *Bailey*.

N. S. Wales. Port Jackson to the Blue Mountains, *Woolls*.

W. Australia. Fraser's Range, *Dempster*, the specimens apparently belonging to this rather than to the typical *A. sericeus*.

4. **A. pertusus,** *Willd.*; *Kunth*, *Enum.* i. 498.—Stems slender, 1 to 2 ft. high, the nodes glabrous. Leaves chiefly at the base of the stem, narrow, glabrous. Spikes 2 to 5, sessile or nearly so at the end of the peduncle without sheathing bracts, 1 to 2 in. long, silky-hairy as in the preceding species, with long hairs on the pedicels and at the base of the sessile spikelets. Spikelets fully 2 lines long, rather obtuse, the outer glume marked above the middle with a small pit which assumes inside the appearance of a projecting gland. Awn slender, about ¾ rarely 1 in. long. Pedicellate spikelet usually containing a male flower.—R. Br. Prod. 201.

Queensland. East Coast, *R. Brown*; Dawson River, *F. Mueller*; Brisbane River, *Bailey*; Rockhampton, *Thozet*, *O'Shanesy*.

N. S. Wales. Mudgee, *Taylor*.

Widely spread over tropical Asia.

5. **A. annulatus,** *Forsk.; Kunth, Enum.* i. 498.—Stems from a tufted base ascending to about 2 ft., the nodes glabrous or slightly bearded. Leaves narrow, usually glaucous. Spikes 2 or 3, nearly sessile at the end of the peduncle without sheathing bracts, 1½ to 2 in. long, the pedicels and base of the sessile spikelets much less ciliate than in the preceding species. Spikelets about 2 lines long. Outer glume of the sessile one membranous, prominently many-nerved, obtuse or 3-toothed, ciliate on the margin and with a few long hairs on the back at the top; 2nd glume thin, the midrib alone prominent, 3rd very thin and hyaline; awn or terminal glume ½ to ¾ in. long, without any hyaline dilatation at the base. Pedicellate spikelet nearly similar but awnless, and with a male flower or reduced to empty glumes.

N. Australia. Upper Victoria River, *F. Mueller.*
Queensland. Rockhampton, *O'Shanesy*; East tropical Australia, *F. Mueller.*

Widely spread over tropical Asia and Africa.

Var? *monostachya*, F. Muell.—Spike single. Sessile spikelets rather longer than in the typical form, the outer glume with fewer nerves and much more ciliate with long hairs.—Victoria River, *F. Mueller*; Nerkool Creek, *Bowman.*

Var? *humilis.* A dwarf plant with 4 to 6 spikes shorter than in the typical form. —Charlotte Waters, Central Australia, *Giles.*

6. **A. Ischæmum,** *Linn.; Kunth, Enum.* i. 499.—An erect grass of 1½ to 2 ft., branching and leafy at the base, quite glabrous, the nodes not bearded in any of our specimens. Leaves narrow, mostly erect, the upper ones few, with long sheaths and short laminæ. Spikes usually 4 to 8, very shortly pedicellate at the end of the peduncle without sheathing bracts, mostly 1½ to 2 in. long, rather slender, with spreading hairs only on the pedicels and at the base of the sessile spikelets. Spikelets scarcely 2 lines long, usually of a purplish colour, the outer glume several-nerved, acute or slightly notched, 2nd glume keeled and acute; 3rd lanceolate and hyaline, but much more developed than in *A. sericeus*; awn or terminal glume ½ to ¾ in. long, without any hyaline dilatation at the base. Pedicellate spikelet with a male flower or reduced to two empty glumes, the 2nd thin one not much shorter than the outer one.—F. Muell. Fragm. viii. 122; Reichb. Ic. Fl. Germ. t. 54.

W. Australia, *Drummond*; Fraser's Range, *Dempster.*

Common in southern Europe and temperate and subtropical Asia. The above Australian specimens are so much like European ones as to suggest the possibility of their being introduced. The species is chiefly distinguished from its nearest allies by the acuteness of the spikelets. Some specimens from Murchison River, *Oldfield*, seem to agree in this respect, but the outer glume is sometimes pitted and they may be a variety of *A. intermedius* with a reduced inflorescence.

7. **A. intermedius,** *R. Br. Prod.* 202.—An erect grass of 2 ft. or more, with the narrow leaves and general habit of *A. Ischæmum*, the nodes varying with or without beards. Spikes slender, 1 to 1½ in. long,

usually numerous, all shortly pedicellate in an oblong terminal panicle of 3 or 4 in. without sheathing bracts, the common rhachis glabrous and always more or less elongated, the pedicels and base of the sessile spikelets more or less ciliate. Spikelets under 2 lines long, narrow and acute or scarcely obtuse and often purplish as in *A. Ischæmum*. Outer glume often, but not always even in the same spike, marked with a dorsal pit as in *A. pertusus*. Awn small and slender. Pedicellate spikelet more developed than in *A. Ischæmum*, and often enclosing a male flower.—*A. inundatus*, F. Muell. in Linnæa, xxv. 444.

N. Australia. Victoria River and Sturt's Creek, *F. Mueller.*

Queensland. Keppel Bay, *R. Brown;* Port Denison, *Fitzalan;* Brisbane River, Moreton Bay, *F. Mueller*, *Bailey;* Rockhampton and numerous localities in South Queensland, *Thozet*, *Bowman* and others.

N. S. Wales. Mudgee, *Taylor.*

S. Australia, Crystal Brook, *F. Mueller.*

W. Australia, *Drummond*, the specimens very imperfect and perhaps wrongly referred. The species appears however to be generally spread over Australia, intermediate in some respects between *A. Ischæmum* and *A. pertusum*, it is readily distinguished in the section by the loose inflorescence with the elongated common rhachis.

SECTION II. CYMBOPOGON.—Spikes 2 together on each peduncle within or above a sheathing bract, forming usually a terminal leafy panicle.

8. **A. procerus,** *R. Br. Prod.* 202.—Stems stout, erect, 3 to 5 ft. high or even more. Leaves long, the lower ones ¼ to ½ in. broad with long sheaths, all glabrous, the ligula broad and jagged. Panicle 6 in. to above 1 ft. long, narrow, dense, with very numerous short branches, the linear acuminate erect sheathing bracts mostly longer than the spikes. Peduncles short, each with a sheathing bract about the middle and 2 erect spikes rarely ½ in. long, the long white hairs concealing the spikelets. Sessile spikelets usually 3, narrow, scarcely 2 lines long; outer glume flattened on the back with 2 prominent nerves not far from the margin and usually 3 fainter ones between them; the 2nd glume narrow, keeled and pointed, 3rd short, very thin and hyaline; awn or terminal glume usually above ½ in. long with a narrow bifid hyaline base. Outer glume of the barren pedicellate spikelets many-nerved.

N. Australia. Groote Island, *R. Brown;* Upper Victoria River, *F. Mueller;* Port Darwin, *Schultz*, *n.* 60, 147, 150, 241, 262.

This and the two following species are certainly very closely allied, but the differences chiefly in foliage appear to be constant. *A. procerus* is also remarkable for its smaller spikelets, *A. lanatus* for the denser wool of the spikes, all three differ from *A. bombycinus* in their erect spikes and much longer awns. F. Mueller, Fragm. viii. 124, unites them all, including *A. bombycinus*, with the *A. laniger*, Desf. of the Mediterranean region, a view in which I am unable to concur.

9. **A. exaltatus,** *R. Br. Prod.* 202.—Stems erect, sometimes scarcely

1 ft. high in southern specimens, above 3 ft. in some of the northern ones. Leaves very narrow, all ending in long subulate points and in the smaller specimens subulate from the sheath, the ligula long and scarious. Nodes usually glabrous. Panicle sometimes short and dense, sometimes long and interrupted. Spikes 2 or very rarely 3 together, ½ to 1 in. long, erect, densely hairy, the common peduncles short with a sheathing bract as in the allied species. Spikelets 2½ to 3 lines long, the 2 prominent nerves of the outer glume almost winged, with 3 to 5 less conspicuous nerves between them. Awns ½ to 1 in. long.

N. Australia. Islands of the North Coast, *R. Brown;* Sturt's Creek, *F. Mueller* Dampier's Archipelago, *A. Cunningham*, *Walcot.*

S. Australia. Torrens River, Crystal Brook, Flinders Range, *F. Mueller ;* Lake Eyre, *Andrews.*

W. Australia, *Drummond, n.* 100 ; Murchison River, *Oldfield ;* Ningham country, *Monger.*

10. **A. lanatus,** *R. Br. Prod.* 202.—An erect grass of 2 or 3 ft. or more, with the habit inflorescence and erect spikes of *A. exaltatus*, but the leaves though narrow usually flat, and the spikes very densely woolly-hairy almost as in *A. bombycinus.* Awns ½ to 1 in. long.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown ;* Port Essington, *Armstrong.*

Queensland. Albany, *F. Mueller ;* Rockingham Bay, *Dallachy;* Mount Wheeler, *Thozet.*

11. **A. bombycinus,** *R. Br. Prod.* 202.—An erect rigid perennial grass of 1½ to 3 ft., usually glabrous except a little silky pubescence on the lower leaf-sheaths, the nodes glabrous or shortly bearded. Leaves narrow, flat, rather rigid, the ligula very prominent, entire. Panicle shortly branched, 3 to 6 in. long, with sheathing bracts of 1 to 2 in. under the branches. Peduncles usually shorter than the bracts, bearing each a narrow sheathing bract and 2 very densely woolly-hairy spikes of ½ to 1 in., at first erect but soon spreading or reflexed. Sessile spikelets 2 to 5, concealed by the silvery-silky hairs. Outer glumes acute, many-nerved but the 2 lateral nerves much more prominent, especially as the flowering advances and the intermediate ones becoming almost obliterated or visible only towards the end of the glume ; 2nd glume thin, with a prominent keel produced into a short point, 3rd very thin, faintly 3-nerved ; terminal flowering glume very thin and hyaline, shortly bifid, with a very fine awn scarcely exceeding the spikelet, or entire without any awn. Pedicellate spikelets reduced to a single narrow many-nerved glume of 2½ to 3 lines.

Queensland. Broad Sound, *R. Brown ;* Peak Downs, *Burkitt ;* Condamine River, *Leichhardt ;* Springsure, *Wuth.*

N. S. Wales. Abundant in the interior from the Murray, Darling and Lachlan to the western boundary, *A. Cunningham, Mitchell, Dallachy, Neilson* and others.

S. Australia. Lynedoch Valley, Gawler Town, Murray River, *F. Mueller ;* Central Australia, *Giles.*

W. Australia. Swan River, *Drummond*, *1st coll. and n.* 985; *Preiss*, *n.* 1842; Murchison River, *Oldfield;* Champion Bay, *Walcot.*

The densely silky-woolly spreading spikes and very short awn, readily distinguish this from the three preceding species.

12. **A. schœnanthus,** *Linn.; Kunth, Enum.* i. 493, *var.* Martini.—Stems erect, not very stout, 2 to 5 ft. high. Leaves narrow, flat, glabrous, the ligula prominent and scarious. Panicle varying from short and dense to 1 or 1½ ft. long and loose but narrow, the lanceolate sheathing acute bracts under each branch mostly exceeding the spikes. Peduncles solitary within the last bract, each bearing a narrow sheathing bract and 2 sessile spikes, at first erect at length spreading, ½ to ¾ in. long, the rhachis and pedicels hairy, but the hairs short not covering the spikelets as in the preceding species. Sessile spikelets 3 to 5, about 2½ lines long; outer glume about 5-nerved, the 2 lateral nerves very prominent towards the end; 2nd glume thin, rigid, slightly keeled, with hyaline ciliate margins, 3rd very thin, hyaline and ciliate; terminal or flowering glume very narrow, hyaline, bifid, with a fine awn about twice as long as the spikelet. Pedicellate spikelet reduced to empty glumes, the outer one many-nerved.—*A. Martini*, Roxb.; Kunth, Enum. i. 494.

Queensland. Herbert's Creek, *Bowman;* Rockhampton, *O'Shanesy.*

Widely spread over tropical Asia. The typical form of the species the most common in India, with the awns very small or obsolete, has not yet been found in Australia.

13. **A. refractus,** *R. Br. Prod.* 202.—A glabrous erect grass of about 2 ft., with the narrow leaves paniculate inflorescence and sheathing bracts of *A. schœnanthus*, and the spikes similarly 2 together about ½ in. long on short bracteate peduncles, but much more divaricate, soon reflexed, and glabrous except a small tuft of short hairs at the base of the sessile spikelets. Sessile spikelets 2 to 5, 2½ to 3 lines long; outer glume acute, many-nerved; 2nd narrow and keeled, 3rd thin and hyaline; terminal or flowering glume hyaline, narrow, either 2-lobed with an awn slightly exceeding the spikelet, or more frequently entire or nearly so and awnless. Pedicellate spikelets neuter or rarely with a male flower, the outer glume many-nerved.—Sieb. Agrostogr. n. 54.

N. Australia. Port Essington, *Armstrong.*

Queensland. Brisbane River, Moreton Bay, *C. Stuart*, *Bailey;* Wide Bay, *Bidwill;* Rockhampton, *O'Shanesy;* Herbert's Creek, *Bowman;* Warwick, *Beckler.*

N. S. Wales. Port Jackson, *R. Brown*, *Woolls;* New England, *C. Stuart.*

Victoria. Mitta-Mitta, *F. Mueller.*

14. **A. lachnatherus,** *Benth.*—Stems rather slender, erect, about 2 ft. high. Leaves narrow, glabrous or sprinkled with long hairs. Nodes not bearded. Panicle looser than in the preceding species with slender but not very long branches solitary or clustered within sheathing bracts or floral leaves. Peduncles exceeding the last

sheathing bracts bearing each 2 spikes but not digitate, one attached lower down than the other, each ½ to ¾ in. long without the awns. Sessile spikelets 3 or 4, the lowest sometimes containing only a male flower, the others with a hermaphrodite flower, 2 to 2½ lines long, slightly hairy. Outer glume obtuse, about 9-nerved, 2nd rather shorter, obtuse, 3-nerved, 3rd very narrow thin and hyaline; awn or terminal glume on a short filiform base, 1 to 2 in. long, the lower part rigid and hirsute with rufous hairs. Pedicellate spikelets narrow, acute, 2½ to 3 lines long, usually containing a male flower, the outer glume many-nerved, often produced into a fine point.—*A. procerus*, F. Muell. Fragm. viii. 124, not of R. Brown.

Queensland. Islands of Moreton Bay, *F. Mueller; Brisbane River, Bailey;* Rockhampton, *O'Shanesy;* Nerkool Creek, *Bowman.*
N. S. Wales. Clarence River, *Beckler.*

SECTION III. SCHIZACHYRIUM.—Peduncles axillary or terminal, bearing each a single spike above a narrow sheathing bract.

15. **A. fragilis,** *R. Br. Prod.* 202.—A slender decumbent much-branched grass, attaining sometimes 2 ft. or more, usually glabrous. Leaves narrow, rather short, the upper ones passing into sheathing bracts. Panicle leafy, slender, secund, consisting of few spikes on very unequal slender peduncles, each with a narrow acute sheathing bract below the spike. Spike slender, 1 to 1½ in. long, with a short hyaline obscurely cup-shaped bract enclosing each notch. Sessile spikelets about 2 lines long, very narrow; outer glume rigid but thin, faintly nerved, the 2 lateral nerves more prominent, 2nd glume keeled, acute, 3rd very thin and hyaline; terminal glume thin and hyaline, divided almost to the base into 2 narrow lobes, the awn between them shortly exserted. Pedicellate spikelets reduced to a single narrow empty glume, tapering into a fine awn, or sometimes in the terminal spikelets acute only.

N. Australia. Upper Victoria River, *F. Mueller;* Port Darwin, *Schultz.*
Queensland. Endeavour River, *Banks and Solander.*

30. IMPERATA, Cyr.

Spikelets with 1 or rarely 2 flowers, usually in pairs one sessile the other pedicellate along the slender continuous rhachis of the short branches of a long cylindrical spikelike panicle, densely silky with the long hairs surrounding and seated on the spikelets. Glumes 4, all thin hyaline and awnless, 2 outer empty ones usually hairy, the 3rd empty or rarely enclosing a flower smaller and without hairs; terminal flowering glume still smaller. Palea usually truncate and jagged at the top. Stamens 2, or 1 only in species not Australian. Styles distinct. Grain small, free, enclosed in the outer glumes.

Besides the Australian species which is widely spread over the temperate and tropical regions especially of the Old World, the genus contains at least one other, chiefly American.

1. **I. arundinacea,** *Cyr.; Kunth, Enum.* i. 477.—A stiff erect perennial 1 to 3 ft. high, glabrous except sometimes a tuft of hairs at the nodes, which however is not so common in Australian as in Indian specimens. Leaves erect, narrow, often longer than the stem. Spike-like panicle very dense, 3 to 8 in. long, regularly cylindrical, silvery white with the long silky hairs concealing the glumes, the dark coloured stigmas and oblong-linear anthers alone protruding. Spikelets 1½ to near 2 lines long; outer glume 5- or 7-nerved, the 2nd 3- or 5-nerved, the 3rd usually empty.—R. Br. Prod. 204; Host, Gram. Austr. iv. t. 40; Reichb. Ic. Fl. Germ. t. 55.

N. Australia, Queensland, N. S. Wales, Victoria and **S. Australia**, apparently very common in all these colonies, being sent from a large number of stations by numerous collectors; Gulf of Carpentaria, Queensland Coast, Port Jackson and Port Lincoln, *R. Brown*.

Tasmania, *R. Brown* (Prod.), but no Tasmanian specimen in his herbarium.

W. Australia. Murchison River, where it rarely flowers, *Oldfield*.

In the majority of specimens, as is generally said of the species in Europe and Asia, the 3rd glume is empty, but in some from Macleay River, *Beckler*, I have seen the 3rd and 4th glumes nearly similar, each with a hermaphrodite flower in its axil.

31. CHRYSOPOGON, Trin.

(Holcus, *R. Br.* partly.)

Fertile spikelets 1-flowered, sessile between 2 pedicellate male or barren spikelets at the end of the filiform unequal simple or divided branches of a terminal panicle, with sometimes 1 to 3 pairs of spikelets on the branch below the terminal 3. Glumes of the fertile spikelets 4, the outer one the largest, awnless, membranous and many-nerved, or more rigid with the lateral nerves prominent and often muricate; 2nd glume narrow, keeled, pointed or produced into a fine straight awn; 3rd much smaller, very thin and hyaline; 4th or terminal glume under the flower slender, flexuose and stipes-like at the base, or dilated hyaline and 2 lobed, with a short or long awn terminal or from between the lobes, twisted in the lower half and bent back above the middle as in *Andropogon*. Palea very small or none. Styles distinct. Grain enclosed in the glumes, but free from them. Pedicellate spikelets awnless, with reduced glumes and usually 1 male flower.

The genus extends over the tropical and temperate regions of the New as well as the Old World. Of the four Australian species one only appears to be endemic, the others extending into tropical Asia and one over nearly the whole area of the genus. They differ from *Andropogon* chiefly in inflorescence, but might not inappropriately be reunited with *Sorghum* in one genus, as originally proposed by Brown and acquiesced in by Beauvois.

Spikelets 3 to 5 lines long, 1 fertile and 2 pedicellate ones to each branch, 2nd glume of the fertile one awned. Awn of the terminal one long and rigid . . . . 1. *C. Gryllus.*

Spikelets scarcely 1½ lines long, 1 to 3 fertile besides the pedicellate ones on each branch, 2nd glume awnless . . 2. *C. parviflorus.*
Spikelets 2½ to 3 lines long, 3 to 5 fertile besides the pedicellate ones on each branch. Panicle narrow, usually compact.
  Panicle 3 to 4 in. long, 2nd glume of the fertile spikelet acute awnless . . . . 3. *C. aciculatus.*
  Panicle 4 to 10 in. long, 2nd glume of the fertile spikelet shortly awned . . . . 4. *C. elongatus.*

1. **C. Gryllus,** *Trin. Fund. Agrost.* 188, *and in Mem. Acad. Petersb. ser.* 6, ii. 317.—An erect glabrous grass of 2 to 4 ft. Leaves long and narrow, with a small ligula. Panicle loose and spreading, 3 to 6 in. long, of numerous capillary simple branches, mostly verticillate, of very unequal length, each bearing a single hermaphrodite spikelet sessile between 2 pedicellate male ones with a tuft of hairs at the base of the sessile one and on the pedicels. Sessile spikelet narrow, 3 to 4 lines long; outer glumes rigid, acute, 5- or 7-nerved, the lateral nerves more prominent and muricate or hispid, with a few short conical or rigid hairs, 2nd glume narrow, hispid only at the end, the keel produced into a fine straight awn, 3rd thin and hyaline; awn or terminal glume long rigid and twisted in the lower part, the hyaline base narrow with short lobes sometimes obsolete. Pedicellate spikelets 3 to 5 lines long, the outer glume membranous tapering into a short fine awn, the inner ones unawned.—*Andropogon Gryllus*, Linn.; Kunth, Enum. i. 504; Sibth. Fl. Græc. t. 67; F. Muell. Fragm. viii. 121; *Holcus Gryllus*, R. Br. Prod. 199.

N. Australia. Cygnet Bay, *A. Cunningham;* Victoria River, Sturt's Creek and Abel Tasman River, *F. Mueller;* in the interior, *M'Douall Stuart;* Gulf of Carpentaria, *Landsborough*, *Gulliver*.

Queensland. Keppel Bay, *R. Brown;* Port Denison, *Fitzalan*, *Dallachy;* Peak Downs, *Burkitt;* Rockhampton, *O'Shanesy*.

N. S. Wales. Between the Darling and Cooper's Creek, *Neilson.*

Central Australia. Alice Springs, *Giles.*

Widely spread over the tropical and warmer temperate regions of the Old World.

Var. *pallidus.* Spikelets rather larger with longer stouter awns.—*Holcus pallidus*, R. Br. Prod. 199; *Pollinia pallida*, Rœm. et Schult. Syst. ii. 829; *Andropogon pallidus*, Kunth, Enum, i. 505.—Islands of the Gulf of Carpentaria, *R. Brown*, and several of the N. Australian specimens above quoted either belong to this variety or closely connect it with the common form.

2. **C. parviflorus,** *Benth.*—Stems 2 or 3 ft. high, the nodes usually but not always bearded. Leaves narrow, scabrous, glabrous or the lower sheaths pubescent or hairy. Panicle 4 to 8 in. long, with very numerous capillary branches mostly clustered and divided, the ultimate branches bearing in the typical form each a single hermaphrodite spikelet between 2 pedicellate male ones, the pedicels and base of the sessile spikelet ciliate. Spikelets scarcely 1½ lines long. Outer glume acute, not awned, finely many-nerved. Awn capillary, 3 to 6 lines

long, without any basal dilatation.—*Holcus parviflorus*, R. Br. Prod. 199; *Andropogon micranthus*, Kunth, Enum. i. 504; *Anatherum parviflorum*, Spreng. Syst. i. 290; *Sorghum parviflorum*, Beauv. Agrost. 132; *Holcus cærulescens*, Gaudich. in Freyc, Voy. Bot. 411. t. 27; *Andropogon violascens*, Nees in Sieb. Agrostoth. n. 65, Steud. Syn. Glum. i. 396; *Chrysopogon violascens*, Trin. in Mem. Acad. Petersb. ser. 6, ii. 319; *Andropogon montanus*, Roxb.; Kunth, Enum. i. 506; F. Muell. Fragm. viii. 122; *Chrysopogon montanus*, Trin. in Spreng. Neu. Entd. ii. 93, and in Mem. Acad. Petersb. ser. 6. ii. 317.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*.

Queensland. Keppel Bay, *R. Brown*; Port Curtis, *M'Gillivray*; Brisbane River, Moreton Bay, *F. Mueller*, *Leichhardt*; Rockhampton, *O'Shanesy*; Herbert's Creek, *Bowman*; Darling Downs, *Wuth*; Peak Downs, *Law*.

N. S. Wales. Port Jackson, *R. Brown*, *Woolls*; Liverpool Plains, *A. Cunningham*; New England, *C. Stuart*; Clarence River, *Beckler*.

Victoria. Hume River, *F. Mueller*.

Var. *spicigera*. Ultimate branches of the panicle bearing one or two sessile spikelets below the terminal one, each accompanied by a pedicellate male.—Port Denison, *Fitzalan*; Brisbane River, *Bailey*, *Prentice*; Tweed River, *Guilfoyle*; Port Jackson, *R. Brown*.

The species appears to be generally dispersed in East India if the *A. montanus* be correctly referred to it, and is also in New Caledonia.

Schultz's specimens from Port Darwin, n. 198, show a tall plant with the habit of *C. elongatus*, but with the small spikelets and bearded nodes of *C. parviflorus*. Our specimen, however, has lost most of its spikelets and is not in a state for accurate determination.

3. **C. aciculatus**, *Trin. Fund. Agrost.* 188 *and in Mem. Acad. Petersb. ser.* 6, ii. 317; *var.?* elatior.—In the typical form the stems from a shortly decumbent branching and leafy base are erect under 1 ft. high, with few long leaf-sheaths and short laminæ; in the Australian specimens the base is wanting, the stem is above 1 ft. high, the leaves rather more developed, with erect rigid laminæ. Panicle narrow, compact, 3 to 4 in. long, with numerous unequal filiform branches, each with 2 to 4 sessile hermaphrodite spikelets accompanied by pedicellate males, the pedicels not ciliate. Spikelets narrow, 2½ to 3 lines long. Outer glume of the sessile spikelets with 2 muricate nerves, and the keel of the 2nd usually ciliate. Awn short and fine with a very slight basal dilatation.

N. Australia. Abel Tasman River, *F. Mueller*.

Sieber's specimens, Agrostotheca, n. 93, represent the typical *C. aciculatus* (*Andropogon aciculatus*, Retz; *A. acicularis*, Kunth, Enum. i. 505), with short leaves crowded at the base of the stem and panicle branches bearing a single sessile spikelet between two pedicellate ones, which is widely spread over tropical Asia and the Mascarene Islands, but these specimens may not be really Australian. F. Mueller's above described specimens at first sight look distinct, but a few Indian ones come very near to them in stature as well as in their rigid upper leaves.

4. **C. elongatus**, *Benth.*—An erect glabrous grass, branching at the base and attaining 3 or 4 ft. or even more, with long narrow leaves.

Panicle in the typical form erect, narrow, dense, 6 to 10 in. long, with very numerous capillary unequal clustered branches, each bearing 3 to 5 or rarely only 1 or 2 hermaphrodite spikelets sessile between 2 pedicellate male ones, the triplets sessile or very shortly pedicellate with a tuft of hairs under each fertile spikelet. Spikelets all narrow, acute, about 3 lines long. Outer glume of the fertile spikelet rigid, with 2 prominent lateral nerves more or less muricate, the intermediate nerves often very faint, 2nd glume narrow, with a muricate or shortly ciliate keel produced into a fine point or short awn, 3rd lanceolate, very thin and hyaline, often ciliate; awn very fine, ¼ to ½ in. long, with a narrow hyaline shortly 2-lobed base.—*Holcus elongatus*, R. Br. Prod. 200; *Andropogon elongatus*, Spreng. Syst. i. 287; F. Muell. Fragm. viii. 121.

N. Australia. Coen River, Gulf of Carpentaria, *R. Brown*; Albert River, *Landsborough*; Sweers Island, *Henne.*

Queensland. Cape York, *M'Gillivray*, *Daemel.*

Var. *filipes.* Leaves narrower, panicle looser with longer filiform branches and the whole panicle often shorter, the awns rather longer.—Endeavour River, *A. Cunningham*; Rockingham Bay, *Dallachy*; Balonne River, *Mitchell*; Rockhampton, *O'Shanesy.*

32. SORGHUM, Pers.

(Holcus, *Br.* partly.)

Fertile spikelet 1-flowered, sessile between 2 pedicellate male or barren ones, at the end of the simple or divided branches of a terminal panicle, with 1 to 5 pairs or triplets of spikelets below the terminal 3. Glumes on the fertile spikelets 4, the outer one the largest, awnless, lanceolate or broad, hard and shining, obscurely nerved, 2nd glume rather hard keeled and acute, 3rd glume shorter, very thin and hyaline, 4th or terminal glume very thin, hyaline and 2-lobed at the base, with an awn between the lobes twisted in the lower half bent above the middle as in *Andropogon.* Palea very small or none. Styles distinct. Grain enclosed in the hard and shining outer glumes, free from them.

The genus extends over the tropical and warm-temperate regions of the New and the Old World. Of the four species recorded as Australian one is perhaps an escape from cultivation, two extend into tropical Asia, the fourth is endemic. They are all allied to *Chrysopogon*, but the more persistent hardened spikelets in dense panicles give them a peculiar aspect readily recognised.

Nodes glabrous or scarcely pubescent. Fruiting spikelets lanceolate, nearly glabrous. Awn short and fine . . 1. *S. halepense.*

Nodes bearded. Fruiting spikelets lanceolate, 2½ to 4 lines long, villous. Awn usually long. Ovary glabrous . 2. *S. plumosum.*

Nodes bearded. Fruiting spikelets ovoid, 2 lines long, sometimes with a short conical apex, villous. Awn not very long. Ovary glabrous . . . . 3. *S. fulvum.*

Nodes glabrous. Fruiting spikelets lanceolate, about 4 lines long, villous. Awn very long. Ovary crowned by a tuft of hairs . . . . 4. *S. intrans.*

1. **S. halepense,** *Pers. Syn.* i. 101.—Stems erect, varying from 2 or 3 to 8 or 10 ft. high, the nodes glabrous. Leaves long and flat, often rather broad, the midrib usually white and prominent. Panicle from 3 or 4 in. to above 1 ft. long, loose and often much branched. Fertile spikelets lanceolate, varying from 2 to above 3 lines long, pale coloured or scarcely purple, not rufous, with a few hairs at the base. Outer coriaceous glume faintly many-nerved, at length smooth and shining, 2nd glume rather smaller, 5-nerved, usually sprinkled with a few hairs; terminal glume hyaline, broad, ciliate, 2-lobed, the awn from the notch very fine and short, rarely nearly twice as long as the spikelet.—*Holcus halepensis*, Linn.; *Andropogon halepensis*, Sibth. Fl. Gr. i. 52, t. 68; Kunth, Enum. i. 502.

A Mediterranean species, much cultivated in some warm countries, of which I have seen single specimens from Brisbane, *Bailey*, Glendon, *Leichhardt*, Port Jackson, *Woolls ?* and West Australia, *Drummond*, probably all escapes from cultivation. F. Mueller, Fragm. viii. 119, comprises under *Andropogon halepensis* the three following *Sorgha* all certainly indigenous in Australia, but their aspect and characters appear to me to be sufficiently constant to retain them as distinct species.

2. **S. plumosum,** *Beauv. Agrost.* 132.—A tall grass closely resembling *S. halepense*, but with the nodes bearded with a dense tuft of hairs and the leaves much narrower. Inflorescence and structure of the spikelets the same, but the smaller branches, pedicels and spikelets more or less villous with hairs usually rufous, besides the dense tuft at the base of the sessile spikelets. Spikelets varying from 2½ to 4 lines long, lanceolate as in *S. halepense*, but less flattened and usually narrower. Outer glume at first several-nerved, at length rigid, shining and apparently nerveless except 2 ciliate nerves near the top, often turning almost black when ripe. Awn often short and capillary, but usually longer and stouter than in *S. halepense*, though never so long as in *S. intrans*. Ovary glabrous.—*Holcus plumosus*, R. Br. Prod. 200; *Andropogon australis*, Spreng. Syst. i. 287.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* Victoria River, *F. Mueller;* Port Darwin, *Schultz*, *n.* 188; Escape Cliffs, *Hulse;* Arnhem's Land, *M'Kinlay.*

Queensland. Port Curtis and Port Molle, *M'Gillivray;* Rockingham Bay, *Dallachy;* Port Denison, *Fitzalan;* Brisbane River, Moreton Bay, *F. Mueller*, *Leichhardt* and others; Rockhampton and numerous localities in South Queensland, *Bowman*, *Thozet* and others.

N. S. Wales. Port Jackson to the Blue Mountains, *A. Cunningham*, *Woolls* and others; New England, *C. Stuart;* Hastings, Macleay and Clarence Rivers, *Beckler* and others.

Victoria. Snowy River, *F. Mueller.*

Kunth's figure of *Andropogon tropicus*, Rev. Gram. t. 97, represents rather *S. plumosum* than *S. fulvum*. Most of the N. Australian and some of the Queensland specimens represent a var. *aristosa* F. Muell, with long narrow spikelets and long awns, but all closely connected with the common form. To this variety may probably be referred, from the short character given, *Andropogon comosus*, Spreng. Syst. i. 287. which sometimes comes near at first sight to some forms of *Chrysopogon Gryllus*, but has the hard broad spikelets characteristic of *Sorghum*.

3. **S. fulvum,** *Beauv. Agrost.* 164.—A tall not very stout grass attaining sometimes 6 to 8 ft., the nodes bearded with a dense tuft of hairs. Leaves narrow, with scabrous edges, Panicle loose, 4 to 8 in. long, the hairs of the pedicels and spikelets of a rich brown as in the darker specimens of *S. plumosus*, but the sessile spikelets only 1½ to 2 lines long, ovate or shortly conical at the top, not much flattened and usually black and shining when ripe. Awn ½ to ¾ in. long. Ovary glabrous.—*Holcus fulvus*, R. Br. Prod. 199; *Andropogon tropicus*, Spreng. Syst. i. 287.

Queensland. Keppel Bay, *R. Brown;* Rockhampton, *O'Shanesy;* Rockingham Bay, *Dallachy.*

Also in tropical Asia, from Ceylon to the Archipelago, S. China and Japan.

4. **S. intrans,** *F. Muell. Herb.*—General habit and foliage of the two preceding species, but the nodes glabrous and the long awns give the dense panicle a different aspect. Fertile spikelets about 4 lines long, nearly terete, obtuse, hard, smooth and shining, glabrous except at the tips, the pedicels covered with long rufous hairs. Outer glume with 2 dorsal protuberances at the end giving it a 3-toothed aspect. Awn rigid, 3 to 4 in. long, the dilated hyaline base not much shorter than the other glumes and broadly 2-lobed. Palea small. Ovary crowned by a dense tuft of hairs not observed in any other species.

N. Australia. Arnhem's Land, *F. Mueller;* Port Darwin, *Schultz, n.* 31, 149, 185; Lagrange Bay, *Hughan.*

33. ANTHISTIRIA, Linn.

(Iseilema, *Anders.*)

Spikelets 1-flowered or empty, 7 rarely 6 in a spike or cluster, 4 male or barren, either sessile or pedicellate in a whorl at the base of the hairy rhachis, 2 or sometimes 1 pedicellate and male or barren on the top of the rhachis with an intermediate sessile fertile one. Glumes in the barren spikelets usually 2, the outer one several-nerved, the inner thin and hyaline, in the male spikelets usually a 3rd smaller hyaline one; in the fertile spikelet glumes 4, the 2 outer ones nearly equal, usually rigid and coriaceous, the outer one obscurely 5- or 7-nerved, the 2nd with 2 prominent nerves the central one very faint, 3rd glume much smaller, very thin and hyaline; 4th very narrow and thin at the base, thickened into a long twisted awn usually bent above the middle. Palea very small and hyaline, sometimes scarcely conspicuous. Styles distinct. Grain free, enclosed in the hardened outer glumes.—Erect leafy branching grasses, the spikes or clusters singly pedunculate within sheathing bracts, or sessile in the bracts and collected many together in compound clusters forming short almost cyme-like leafy panicles.

The genus is spread over the warmer regions of the Old World, extending into South Africa, the several species described as American being now referred to *Andro-*

pogon (*Cymbopogon*) *bracteatus*, Willd. Of the four Australian species one is a common Asiatic and African one, the other three appear to be endemic.

The 4 whorled barren spikelets sessile. Awn very long and rigid.
  Spikelets in dense compound clusters, sessile within the bracts.
    Bracts glabrous. Barren spikelets glabrous or sprinkled with long cilia. Fertile spikelet glabrous or shortly pubescent at the end . . . . 1. *A. ciliata.*
    Bracts sprinkled with long spreading hairs. Spikelets nearly of *A. ciliata* . . . . 2. *A. frondosa.*
  Spikelets with the surrounding barren ones on slender pedicels within the sheathing bracts. Barren spikelets glabrous. Fertile one densely villous with brown hairs . . . . 3. *A. avenacea.*
The 4 whorled barren spikelets pedicellate, all the spikelets glabrous. Awns very fine . . . . 4. *A. membranacea.*

A. flosculosa, F. Muell. Fragm. x. 75, from Port Curtis, *C. Moore*, is unknown to me. As far as the description taken from a fragmentary specimen goes, it appears to me to be very near *A. avenacea*, differing in the involucral spikelets being 6 or 8 instead of 4.

1. **A. ciliata,** *Linn.*; *Kunth, Enum.* i. 481.—Stems 1 to 3 ft. high. Leaves narrow, glabrous or the sheaths hairy; ligula very short, sometimes ciliate. Spikes or clusters of spikelets not numerous, sessile or the lower ones pedunculate in a short terminal leafy panicle, the leafy bracts subtending each spike sheathing at the base and tapering into points longer than the cluster, the short rhachis bearded with long brown hairs. Spikelets narrow, 4 to 5 lines long, 4 male or barren sessile at the base of the bearded rhachis, 2 or 1 pedicellate at the top, glabrous or sprinkled with a few long hairs: outer glume the largest, acute, many-nerved, 2nd shorter, thin and 3- or 5-nerved, 3rd thin and hyaline. Fertile terminal spikelet glabrous or shortly pubescent at the end; outer glume broad, obtuse, rather thick, about 7-nerved, 2nd rigid, rather shorter and narrower, with 2 prominent lateral nerves and a faint central one, 3rd narrow-oblong, very thin and hyaline; awn or 4th glume very long and rigid, the attenuate base not dilated.—*A. australis*, R. Br. Prod. 200; Hook. f. Fl. Tasm. ii. 107, t. 156; F. Muell. Fragm. v. 207; *A. cæspitosa*, Anders. Monogr. Androp. 13, and, from the character given, *A. cuspidata*, Anders. l.c. 14.

Abundant throughout **Australia** and **Tasmania**, known everywhere as 'Kangaroo grass,' and sent from various localities by numerous collectors (*Sieber, Agrostoth. n.* 61, *Drummond, n.* 984, *Preiss, n.* 1843, *Schultz, n.* 158, 179; Port Jackson and Port Lincoln, *R. Brown*, etc.). Spread also over tropical Asia and Africa.

2. **A. frondosa,** *R. Br. Prod.* 200.—Very near *A. ciliata*, but upon a larger scale. Stems erect and branching, from 2 or 3 ft. to twice that height, frequently flattened under the lower nodes. Leaves glabrous or the upper sheaths ciliate. Leafy panicle dense, often nodding, the leafy bracts narrow, ciliate on the back with long spreading hairs, the outer ones 2 to 3 in. long. Spikes or clusters as in *A. ciliata*, with

the 4 involucral spikelets sessile, the outer glume of the fertile spikelet very rigid, scarcely nerved, obtuse, pubescent at the top with short rigid hairs. Awn as long as or often longer than in *A. ciliata.* Many of the spikes reduced to the 4 involucral barren spikelets surrounding a rudimentary one.

N. Australia. Islands off the north coast, *R. Brown;* Arnhem's Land, *F. Mueller;* Port Darwin, *Schultz, n.* 155, 180, 217.

3. **A. avenacea,** *F. Muell. Fragm.* v. 206.—Stems from a more or less silky-hairy or woolly base, 2 to 3 ft. high. Leaves very narrow, glabrous. Sheathing bracts narrow, membranous, glabrous, 1 to 2 in. long. Spikes or clusters all on rather long, slender, glabrous or ciliate peduncles within the last bract. Barren spikelets either reduced to a single several-nerved rigid glume with a small hyaline one inside, or more developed, enclosing a male flower, the four involucral ones sessile. Fertile spikelets about 4 lines long, the rigid outer glumes, especially the lowest, densely villous with brown hairs. Awn long and rigid as in the two preceding species.—*A. basisericea,* F. Muell. Fragm. v. 207.

N. Australia. Upper Victoria River, *F. Mueller.*

Queensland. Brisbane River, *Bailey;* Condamine and Gwydir Rivers, etc., *Leichhardt;* Rockhampton and other localities in the southern districts, *O'Shanesy, Bowman* and others; Peak Downs, *F. Mueller.*

N. S. Wales. In the interior, Lachlan River, *Fraser;* Liverpool plains, *A. Cunningham;* from the Darling to Cooper's Creek, *Neilson.*

Central Australia, *Gosse.*

W. Australia. King George's Sound, *Baxter;* Swan River, *Drummond,* 1*st coll.*; Murchison River, *Oldfield.*

F. Mueller had at first distinguished the western plant by the silky-hairy base of the stem or lowest sheaths, which has since proved to be also in the eastern specimens. The species is probably referrible to the section *Androscepia,* proposed as a genus by Brongniart for the *Anthistiria gigantea,* Cav.

4. **A. membranacea,** *Lindl. in Mitch. Trop. Austr.* 88.—Quite glabrous, sometimes forming dense leafy tufts of 6 in., the branching stems often elongated to 1 or 2 ft. Leaves flat, appearing almost articulate on the short flat prominently striate sheaths. Floral leaves or bracts with coriaceous sheaths and short lanceolate laminæ. Panicles small, dense, almost cyme-like as in *Apluda,* with very numerous small spikes or clusters, each subtended by a scarcely longer bract. Spikelets scarcely 2 lines long, glabrous, the four involucral ones pedicellate, the fertile one rather longer than the 2 pedicellate barren ones beside it. Glumes all thin, the outer one acute with several green nerves, the second with 1 or 3 nerves, the awn very fine, scarcely more than as long again as the spikelet.—F. Muell. Fragm. v. 207; *Iseilema Mitchellii,* Anders. Monogr. Androp. 24.

N. Australia. Sturt's Creek, *F. Mueller, Gregory;* Nichol Bay, *Mrs. Crouch.*

Queensland. On the Narran, *Mitchell;* Peak Downs, *F. Mueller;* Barcoo, *Wuth.*

N. S. Wales. Between the Darling and Cooper's Creek, *Neilson.*

Central Australia, *Giles;* near Lake Eyre, *Andrews.*

Var. *trichopus.* A tuft of long hairs under the fertile spikelet.—Hooker's Creek, *F. Mueller.*

34. APLUDA, Linn.

Spikelets with 1 fertile flower and a male one below it, sessile between 2 flattened pedicels, bearing each a rudimentary or barren spikelet, the whole embraced by a sheathing bract, the bracts clustered on the branches of a leafy panicle. Outer glume of the sessile spikelet concave, striate, awnless, 2nd glume acute, awnless, thin but stiff, 3rd very thin and hyaline, 4th or terminal glume very thin and hyaline, entire or bifid at the top, awnless or with a slender twisted terminal awn. Palea very thin or none. Styles distinct. Grain enclosed in the outer glumes, free from them.

A small genus spread over tropical Africa and Asia, the subjoined species a common one, perhaps not indigenous in Australia.

1. **A. mutica,** *Linn.; Kunth, Enum.* i. 516.—Stem creeping or climbing, several feet long, with erect branching flowering shoots. Leaves long, usually glabrous. Panicles loose and leafy, 1 to 2 ft. long. Bracts subtending the spikelets 3 to 4 lines long, very concave, striate, with short sometimes awn-like points, in clusters of 5 or 6. Sessile spikelet shorter than the bract; pedicellate spikelets either reduced to a rudimentary glume or more developed and protruding beyond the bract. Awns of the terminal glume very minute or entirely deficient.

N. S. Wales? In *Leichhardt's* collection, without indication of the precise station, and therefore perhaps not really wild.

SUBTRIBE V. TRISTEGINEÆ.—Spikelets paniculate, all similar, the terminal glume often small and thin at the time of flowering, but more or less enlarged and stiffened or hardened round the fruit, and usually with an awn twisted and bent as in other Andropogoneæ, but sometimes very small or deficient.

The few genera collected under the above name have been proposed as a distinct tribe intermediate as it were between Paniceæ and Andropogoneæ, but they appear to me to be so much nearer to Andropogoneæ as to justify their being placed under them as a subtribe. The genera with only 2 empty glumes besides the flowering one have been generally referred to Agrostideæ, from which they differ essentially in the articulate pedicel, the outer glumes enclosing the fruit and falling off with it.

35. ARUNDINELLA, Raddi.

Spikelets with 1 terminal hermaphrodite flower and often a second male one below it, in a loose terminal panicle. Glumes 4, the 3 outer ones often pointed but not awned, the 3rd with a palea or a male flower in its axil; terminal flowering glume smaller, thinner, with a fine awn twisted in the lower part and bent back at or below the middle. Palea smaller. Styles distinct. Grain enclosed in the more or less stiffened glume and palea, free from them.

A tropical or subtropical genus, chiefly Asiatic, with a few African and American species. Of the Australian species one is a common Indian one, the other apparently endemic. Both belong to the section *Acratherum* in which the terminal glume is entire or slightly notched without bristle-like points on each side of the awn.

Outer glume nearly as long as the spikelet, with a short point . . . . 1. *A. nepalensis.*
Outer glume about half the spikelet, with a long point . . . . 2. *A. Schultzii.*

1. **A. nepalensis,** *Trin. Spec. Gram. t.* 268.—An erect glabrous perennial, attaining 6 to 8 ft. Leaves narrow, the ligula short, minutely ciliate. Panicle narrow, dense or loose, erect or slightly spreading, varying from 4 to 6 in. in the smaller specimens to above 1 ft. in luxuriant ones, the lower branches densely clustered. Spikelets all or mostly pedicellate, narrow, about 2 lines long, the 3 outer glumes usually 5-nerved, tapering to short points, the lowest rather shorter than the others, the 3rd rather thinner, with a male flower in its axil. Terminal flowering glume smaller and thinner at the time of flowering, slightly notched with minute obtuse or acute points on each side of the awn not produced into bristles. Palea auriculate on each side near the base.—*Acratherum miliaceum*, Link, Hort. Bot. Berol. i. 230.

N. Australia. Upper Victoria River, *F. Mueller.*
Queensland. Brisbane River, Moreton Bay, *Bailey;* Dry Beef Creek, *Leichhardt;* Rockhampton and neighbourhood, *Thozet, O'Shanesy;* Darling Downs, *Law;* Springsure, *Wuth;* Herbert's Creek, *Bowman;* Rockingham Bay, *Dallachy.*
N. S. Wales. Liverpool Plains, *Leichhardt.*

Widely distributed over the hilly districts of tropical Asia, extending to South Africa.

2. **A. Schultzii,** *Benth.*—Stems erect, rather slender but rigid, 3 ft. high or more. Leaves narrow, glabrous except a few long hairs at the orifice of the sheath. Panicle narrow, 3 to 4 in. long in our specimens. Spikelets 2 lines long or rather more, on shorter pedicels than in *A. nepalensis* or almost sessile. Outer glume broad, 3-nerved, scarcely half as long as the spikelet, with an awnlike point nearly as long; 2nd glume as long as the 3rd, 5-nerved, with a short point, 3rd 5-or 7-nerved, thin, with a small bifid palea in its axil; terminal flowering glume thin, about 5-nerved, tapering into a short fine awn, at length bent back about the middle as in the rest of the genus.

N. Australia. Port Darwin, *Schultz, n.* 31.

36. POLYPOGON, Desf.

Spikelets 1-flowered, in a dense spikelike or slightly spreading panicle, the pedicels articulate, with a tuft of short hairs above the articulation; glumes 3, 2 outer empty ones with a terminal straight awn, the terminal flowering glume smaller, thinner, entire or notched, with an awn in the notch or on the back, either twisted at the base and bent back at or below the middle, or small and straight or reduced to a minute point. Palea smaller. Styles short, distinct. Grain enclosed in the slightly stiffened glume and palea, free from them.

A small genus, very widely distributed over the globe. Of the three Australian species two have a wide range over the temperate and subtropical regions of the Old World, although their limits systematic as well as geographical are not yet satisfactorily determined, the third appears to be endemic. The genus is generally placed under Agrostideæ, but the articulation of the pedicel is very conspicuous, and the general structure is almost precisely that of *Garnotia*, from which indeed *Polypogon* only differs in the inflorescence dense and spikelike, not loosely paniculate.

Awns of the empty glumes 3 or 4 times as long as the glume, of the flowering glume very short or none . . 1. *P. monspeliensis.*
All the awns very short . . . . 2. *P. fugax.*
Awn of the flowering glume longer than those of the empty glumes, twisted at the base and bent. Stamen 1 3. *P. tenellus.*

P. simplex, Spreng. Syst. Cur. Post. 30, said to be Australian on the authority of Sieber's Agrostotheca n. 94, under the name of *Podosæmum, sp. n.* Nees, is unknown to me, the very short diagnosis might apply to *P. maritimus*, DC. and the specimen may not be Australian. It has been named *Trichochloa simplex* by Rœm. and Schult. Syst. Addit. ad Mant. Cl. iii. 577, and *Muehlenbergia simplex* by Kunth, Enum. i. 203, but both authors have merely copied Sprengel's diagnosis.

1. **P. monspeliensis**, *Desf.*; *Kunth, Enum.* i. 232.—An annual procumbent at the base or rarely erect, ascending to 1 or 2 ft., glabrous or nearly so. Leaves flat, the ligula rather large. Spikelike panicle cylindrical or slightly branched, very dense, 1 to 3 in. long, often of a yellowish shining green. Spikelets very numerous but almost concealed by the fine awns, the hairs surrounding the spikelet above the articulation few and very short. Outer glumes scarcely 1 line long, pubescent or ciliate, obtuse or notched, the fine straight awn 3 or 4 times as long as the glume. Flowering glume broad, hyaline, truncate or jagged, the awn usually reduced to a short point or entirely wanting. —Hook. f. Fl. Tasm. ii. 117; Reichb. Ic. Fl. Germ. t. 31.

N. S. Wales. Port Jackson, *Woolls*; Lord Howe's Island, *C. Moore.*

Victoria. Port Phillip and Darebin Creek, *F. Mueller*; Ballarat, *Bacchus*; Little River, *Fullagar.*

Tasmania. Launceston, *Gunn*; Southport, *C. Stuart*; Swanport, *Story.*

S. Australia. Holdfast Bay, *F. Mueller.*

W. Australia, *Drummond*; Murchison River, *Oldfield.*

The species is common in most temperate and subtropical regions of the Old

World and has also been sent from America, but in many stations and perhaps in most of the Australian ones rather as an introduced weed.

2. **P. fugax,** *Nees in Steud. Syn. Glum* i. 184.—Apparently annual, glabrous, 1 to 2 ft. high, with the foliage of *P. monspeliensis*. Spikelike panicle dense, 3 to 4 in. long, larger and more distinctly branched than in *P. monspeliensis*, the shortness of the awns and rather larger spikelets giving it a very different aspect. Outer glumes 1½ to near 2 lines long, scabrous or hispid, with 2 hyaline terminal lobes, the intermediate awn scarcely so long as the glume. Flowering glume not half so long, broad and notched or 2-lobed, the very short awn usually attached on the back a little below the notch.

W. Australia, *Drummond;* Busselton, *Pries.*

These specimens have been identified by Munro with the Indian ones described by Nees under the name of *P. fugax*, they also closely resemble some South American specimens of *P. interruptus*, H. B. et K. They can scarcely be considered as a short-awned variety of *P. monspeliensis*, and perhaps come nearer to the similarly short-awned *P. littoralis*, Sm. The latter is however usually a perennial with a smaller spikelike panicle, and the glumes narrow and scarcely 1 line long. A specimen from Ravenswood in Tasmania, in Herb. F. Mueller, is very near the true *P. littoralis*, but is probably only an introduced weed.

3. **P. tenellus,** *R. Br. Prod.* 173.—Apparently annual, decumbent at the base, ascending from 6 in. to near 2 ft. but usually much more slender than in *P. monspeliensis*, the spikelike panicle narrower, not so dense, rarely 2 in. long. Outer glumes in the typical form scarcely above 1 line long, narrow, entire, ciliate or villous on the keel and margins, tapering into fine straight awns of 2 to 4 lines, the hairs of the pedicel round the base of the spikelet more prominent than in *P. monspeliensis*. Flowering glume much shorter, broad, acute or scarcely notched, the awn attached below the apex, longer than, often twice as long as, those of the outer glumes, twisted in the lower part, bent about the middle. Palea very narrow. Stamen 1.

W. Australia. King George's Sound, *R. Brown;* Gordon River, *Oldfield.*

Var. *Drummondii.* Spikelets rather larger, often purplish, scabrous or glabrous except the tuft of hairs surrounding the base. Awn of the flowering glume more than twice as long as the outer awns.—*P. Drummondii*, Steud. Syn. Glum. i. 184.—W. Australia, *Drummond 4th. coll. n.* 369.

Var. *Oldfieldii.* Spikelike panicle dense. Spikelets small and villous or ciliate as in the typical form but the awns all fine and rather long, those of the outer glumes nearly as long as those of the flowering ones.—Murchison and Bowes Rivers, *Oldfield.*

TRIBE III. OLYREÆ.—Spikelets 1-flowered, unisexual, the two sexes in the same panicle. Glumes 3, the flowering one large, membranous or hardened and enclosing the grain, the outer ones empty. A palea to all the flowers. Stamens 6, or in genera not Australian 3. Styles more or less united with 2 or 3 long feathery stigmas.—Leaves usually broad and often petiolate above the sheaths.

Besides the Australian genus the tribe comprises a few American ones, the farther study of which may require some modification in the above character. It is clear however that neither *Leptaspis*, nor its nearest ally *Pharus*, can be associated with any other tribe of Gramineæ.

37. LEPTASPIS, R. Br.

Spikelets unisexual, monœcious, 1-flowered, pedicellate in a loose terminal panicle. Glumes 3, the 2 outer empty ones small, broad; 3rd or flowering glume larger, membranous, 5- or 7-nerved, ovoid or globular, open down the inner side in the males, closed in the females except a small terminal but excentrical orifice. Palea small, lanceolate, flat, 2-nerved. No lodicules. Stamens in the males 6 without any rudimentary ovary. No staminodia in the females. Style entire to the orifice of the glume with 3 exserted feathery stigmas. Grain enclosed in the utricular enlarged glume.

A small genus extending over tropical Asia and African, the only Australian species endemic. It is in many respects allied to the American *Pharus*.

1. **L. Banksii**, *R. Br. Prod.* 211.—Stems from a horizontal or shortly creeping rhizome 1½ to 2 ft. high, leafy only in the lower part. Leaves petiolate above the long narrow sheaths, lanceolate, flat, acute, 4 to 8 in. long and ½ to 1 in. broad, glabrous or sprinkled with minute hairs. Panicle very loose, ½ to 1 ft. long, the filiform branches few, distant, spreading, more or less divided. Spikelets distant, pedicellate or 1 or 2 almost sessile on the smaller branchlets, the terminal one of each branchlet usually male, the lower ones female. Outer glumes broad and concave especially in the females, almost black when dry, the largest under 1 line long, the outer one still smaller. Flowering glume nearly globular but open in the males, rather above 1 line diameter, pubescent in the females, 1 line diameter when in flower, 2 lines when in fruit and quite closed except the minute terminal orifice.—*Pharus Banksii*, Spreng. Syst. ii. 114.

Queensland. Endeavour River, *Banks and Solander*, *A. Cunningham*; Cape York, *Daemel*; Rockingham Bay, *Dallachy*.

TRIBE V. PHALARIDEÆ.—Spikelets with 1 terminal hermaphrodite flower and rarely 2 male flowers lower down. Glumes 2 to 6, all keeled or with a central nerve, 2 below the articulation of the rhachis empty and persistent, but deficient in several genera, 4 or fewer above the articulation, of which 2 (usually the 2 inner ones) larger and enclosing the grain, 1 or 2 outer ones usually small and empty or deficient, rarely larger and enclosing each a male flower with a palea, but no distinctly 2-nerved palea to the terminal fertile flower. Stamens 6 or fewer.

It has appeared to me that the genera in this tribe form a very distinct group, characterised by the bract immediately enclosing the fertile flower having almost if not quite always a central nerve, and being therefore probably a glume on the axis of the spikelet and not a palea on the axis of the flower, although, when the flower is apparently terminal, the two axes being confounded into one cannot be distinguished with certainty. The arrangement of the spikelet is thus brought very close to that of *Kyllinga* and *Courtoisia* in Cyperaceæ. It has been objected to me that in *Phalaris* itself the uppermost bract, whether glume or palea, is 2-nerved, and so it appears if seen from the inside, but on the outside there is usually an intermediate angle fringed with a line of hairs which appears to indicate a central nerve and never occurs in the true palea, and the next glume enclosing it, which is really 5-nerved, appears often to be only 2- or 4-nerved if seen from the inside, the central nerve being often very faint and short whilst one on each side is more conspicuous and reaches the apex. In all the other genera the central nerve is very distinct.

38. LEERSIA, Swartz.

(Asprella, *Rœm. and Schult.*)

Spikelets 1-flowered, flat, articulate on short pedicels along the filiform branches of a terminal panicle. Glumes 2, complicate and keeled, the outer one the largest. No 2-nerved palea. Stamens 6 or in species not Australian 3 or fewer. Styles short, distinct. Grain enclosed in the slightly hardened glumes, free from them.

A small genus, spread over the tropical and temperate regions of the globe, the only Australian species common to the New and the Old World.

1. **L. hexandra,** *Swartz.*; *Kunth*, *Enum.* i. 6.—An erect though weak glabrous grass, attaining several feet, often rooting in the mud at the lower nodes. Leaves rather narrow, flat when fresh, mostly erect. Panicle oblong, 2 to 4 in. long, with erect or slightly spreading filiform flexuose branches. Spikelets narrow-ovate, about 1½ lines long. Glumes membranous, acute, the outer one with a prominent nerve on each side besides the marginal one; the inner glume nearly as long, but narrower, with only one nerve on each side near the margin. Stamens 6.—*L. australis*, R. Br. Prod. 210; *Asprella australis*, Rœm. and Schult. Syst. ii. 267; *L. mexicana*, Kunth, Rev. Gram. t. 1.

Queensland. Keppel Bay, *R. Brown*; Port Curtis, *M'Gillivray*; Rockhampton *Thozet*, *O'Shanesy*; Brisbane River, Moreton Bay, *F. Mueller*, *Leichhardt* and others.

N. S. Wales. Port Jackson, *R. Brown*.

39. ORYZA, Linn.

Spikelets 1-flowered, flat, articulate on short pedicels or sessile along the flexuose branches of a terminal panicle. Glumes 4, 2 outer ones small, lanceolate, 2 upper ones complicate and keeled, the outer one the largest. No 2-nerved palea. Stamens 6. Styles short, distinct. Grain enclosed in the hardened almost coherent upper glumes, but free from them.

A genus of very few species from the warmer regions of the New and the Old World, the only Australian species of Old World origin, but in very general cultivation.

1. **O. sativa,** *Linn.; Kunth, Enum.* i. 7.—Stems creeping or floating at the base, ascending to several feet. Leaves long and rather broad, very scabrous especially on the upper side, otherwise glabrous, the ligula prominent scarious and jagged. Panicle narrow, erect, 6 in. to above 1 ft. long. Spikelets ovate-oblong, 3 to 4 lines long. Outer glumes scarcely ½ line long and nerveless, upper ones very prominently nerved, the keels usually ciliate, the outer one with 1 nerve on each side besides the nerve-like margin, closely embracing and almost connate with the inner glume, which is as long but narrower with only 1 nerve on each side near the thin margin, both glumes either shortly awned or in some cultivated varieties awnless or the outer one with a straight awn of ¼ to 3 in., and the inner with only a short point.—F. Muell. Fragm. viii. 115; Döll. in Mart. Fl. Bras. Gram. t. 1.

N. Australia. Marshes about Hooker and Sturt's Creek, really wild, *F. Mueller.* Common in East India in the wild state (*Roxburgh*), besides the numerous varieties cultivated in various countries under the name of *Rice.*

40. POTAMOPHILA, R. Br.

Spikelets 1-flowered, polygamous, not flattened, articulate on very short pedicels along the filiform branches of a terminal panicle. Glumes 4, 2 outer ones very small membranous, nerveless, 2 upper ones much larger, membranous but prominently nerved, the outer one the broadest. No 2-nerved palea. Stamens 6. Styles short, distinct. Grain enclosed in the larger glumes, free from them.

The genus is limited to the single species endemic in Australia..

1. **P. parviflora,** *R. Br. Prod.* 211.—An aquatic glabrous grass of 3 to 5 ft. Leaves narrow and erect, convolute when dry, scabrous; ligula prominent, jagged. Panicle narrow, 1 to 1½ ft. long or even more. Spikelets very numerous, about 1¼ lines long, pale-coloured or purplish, ovoid-oblong, the males and females very similar and variously intermixed, with a few barren ones reduced to empty glumes. Larger glumes membranous, rather acute, concave, the outer one 5-nerved, the inner one 3-nerved.—Kunth, Rev. Gram. t. 5; Trin. Spec. Gram. t. 249.

N. S. Wales. Williams River, *R. Brown;* Hastings River, *Beckler*, the specimens few, and not seen in any other collection.

* 41. EHRHARTA, Thunb.

Spikelets 1-flowered, pedicellate in a terminal panicle rarely reduced to a simple raceme, the rhachis of the spikelet articulate above the 2 outer glumes. Glumes 6, 2 outer persistent, usually small, the 3rd various sometimes awned, the 4th usually the largest and sometimes awned, the 5th rather smaller and the 6th narrower and thinner, both keeled and never awned. Flower terminal. No palea. Lodicules large, very thin. Stamens 6, rarely 3. Styles short, distinct. Grain enclosed in the larger glumes but free from them.

The genus is limited to South Africa and the Mascarene Islands. The two species subjoined have evidently been introdueed into Australia.

Spikelets about 4 lines long without the awns; 3rd and 4th glumes rigid, prominently nerved, awned . . . . . 1. *E. longiflora.*
Spikelets about 2¼ lines long; not awned; 3rd glume short, very thin, 4th faintly nerved rather more rigid . . . . 2. *E. brevifolia.*

* 1. **E. longiflora,** *Sm. Ic. Ined.* t. 32.—An erect glabrous grass, attaining 2 or 3 ft. but often much smaller. Leaves flat, sometimes rather long, slightly scabrous. Panicle loose, narrow, 3 to 6 in. long, the branches and pedicels filiform. Outer persistent glumes obtuse, 2 to 3 lines long, often purplish, the 2nd rather longer than the first, 3rd and 4th glumes 3 to 4 lines long, scabrous-pubescent, rigid, 3-nerved, tapering into an awn as long as themselves, and each with a tuft of hairs at their base on the slightly elongated rhachis, the 4th contracted into a short stipes; 5th and 6th glabrous, unawned. Stamens 6, or rarely in a few flowers reduced to 5 or 4.—Swartz in Trans. Linn. Soc. vi. 56, t. 4; Kunth, Enum. i. 14.

W. Australia. Naturalised about King George's Sound, *F. Mueller.*
Victoria. Now wild on the Wimmera, *F. Mueller.*

A native of South Africa introduced into the island of St. Helena on one side as into Australia on the other.

* 2. **E. brevifolia,** *Schrad.*; *Kunth, Enum.* i. 13.—Stems from a shortly creeping or tufted base about 1 ft. high. Lower leaves rarely above 1 in. long, upper ones few with long sheaths, all glabrous. Panicle loose, shortly branched or almost reduced to a raceme, 3 to 5 in. long, the pedicels and branches filiform. Spikelets nearly 2¼ lines long, the outer persistent glumes nearly equal, rather obtuse, not much shorter than the spikelet, 3rd glume very thin, obtuse, ciliate, about half the length of the spikelet, with a callosity on each side at the base but no tuft of hairs, 4th and 5th thin but rather more rigid, sprinkled with a few long hairs, the 4th the largest tapering into a short point, the 5th rather shorter and acute, the 6th enclosing the flower scarcely half as long. Stamens not seen in the Australian specimens the grain being nearly ripe, 6 in the African plant.

W. Australia, *Drummond, n.* 142. The specimens seen rather numerous but unaccompanied by any memoranda. I can find nothing to distinguish them from the South African *E. brevifolia*, and therefore conclude them to represent an introduced plant. Although the number of stamens is not known the inflorescence is that of *Ehrharta* not of *Tetrarrhena.*

42. MICROLÆNA, R. Br.

(Diplax, *Hook. f.*)

Spikelets 1-flowered, on filiform pedicels in a narrow loose panicle, the rhachis of the spikelet articulate above the 2 outer glumes. Glumes 6, 2 outer short and persistent, 3rd and 4th long narrow and awned, 5th and 6th shorter acute unawned, all keeled. Flower terminal. No palea. Lodicules large, very thin. Stamens 4 or 2. Styles distinct. Grain enclosed in the larger glumes but free from them.

A small genus, confined to Australia and New Zealand, one of the Australian species common to New Zealand, the other endemic.

The genus is closely allied to *Tetrarrhena*, differing in the loose inflorescence and awned glumes. The tufts of short cilia at the base of the 3rd and 4th glumes are not in *Tetrarrhena*, but are often very much reduced in *Microlæna tasmanica.*

Stamens 4. Rhachis of the spikelet slightly elongated between the 3rd, 4th and 5th glumes	1. *M. stipoides.*
Stamens 2. Glumes all close above each other	2. *M. tasmanica.*

1. **M. stipoides,** *R. Br. Prod.* 210.—Stems from a perennial rhizome erect or ascending, 1 to 2 ft. high. Leaves usually rather short, flat or convolute and very acute, glabrous or slightly hairy. Panicle narrow, 3 to 6 in. long, with filiform erect branches and pedicels. Spikelets narrow, 4 to 5 lines long without the awn, 2 outer persistent glumes minute; 3rd and 4th glumes narrow, rigid, with 3 prominent scabrous nerves, tapering into a fine awn, with a tuft of hairs at their base on the slightly elongated rhachis, the 4th rather longer than the 3rd and its awn sometimes much longer, 5th glume rather shorter, acute but not awned, the nerves not prominent, 6th shorter very narrow and thin but stiff. Stamens 4.—Hook. f. Fl. Tasm. ii. 105; *Ehrharta stipoides*, Labill. Pl. Nov. Holl. i. 91, t. 118; F. Muell. Fragm. vii. 90; *Microlæna Gunnii*, Hook. f. l. c. 105, t. 155, A.

Queensland. Brisbane River, *Bailey;* Darling Downs, *Leichhardt.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls* and others; Macleay River, *Beckler;* New England, *C. Stuart.*

Victoria. Yarra River, *F. Mueller;* Ballarat, *Bacchus.*

Tasmania. Launceston, *Gunn;* Cheshunt, *Archer;* Huon River, *Oldfield;* Southport, *C. Stuart;* Swanport, *Story.*

S. Australia. Round St. Vincent's Gulf, *F. Mueller.*

W. Australia, *Drummond, n.* 395; Blackwood River, *Oldfield;* Busselton, *Pries.*

Also in New Zealand.

2. **M. tasmanica,** *Hook. f.*—Stems from a tufted or shortly creeping base erect, slender, mostly under and rarely much above 1 ft. high. Leaves at the base of the stem short, narrow but flat, on the stem very few with short laminæ far below the panicle. Panicle loose, pyramidal

or narrow, 2 to 3 in. long, the pedicels and short branches filiform. Outer persistent glumes unequal, the lowest ½ to ¾ line, the 2nd 1 to 1½ lines long, the 3 next glumes almost close above the outer ones with very short and few hairs at their base, narrow, acute, 3 to 4 lines long, prominently 5-nerved, the 3rd with a short point or glume, the 4th rather longer with an awn sometimes as long as the glume, the 5th acute but not awned, 6th or flowering glume shorter, keeled, faintly nerved. Stamens (always ?) 2.—*Diplax tasmanica*, Hook. f. Fl. Tasm. ii. 105, t 155, B ; *Ehrharta diarrhena*, F. Muell. Fragm. vii. 89.

Tasmania. Recherche Bay, *Gunn ;* South Port, *C. Stuart.*

Var. *subalpina*, F. Muell. Leaves rather longer. Stem short. Spikelets smaller than in the typical form.—Halfway up Mount Lapeyrouse, *Oldfield ;* Lake St. Clair, *Gulliver.*

43. TETRARRHENA, R. Br.

Spikelets 1-flowered, sessile or very shortly pedicellate in a simple spike or in a scarcely branched spikelike panicle, the rhachis of the spikelet articulate above the 2 outer glumes. Glumes 6, 2 outer small and persistent, the 3rd various, the 4th usually the largest and rigid, the 5th similar but usually smaller, the 6th narrower but keeled like them, none of them awned. Flower terminal. No palea. Lodicules large, very thin. Stamens 4. Styles short, distinct. Grain enclosed in the larger glumes but free from them.

The genus is limited to Australia. It is closely allied to the South African *Ehrharta*, with which F. Mueller, following Sprengel, unites this and the preceding genus, but the dimerous not trimerous andrœcium, together with the geographical range, appear sufficient to maintain them as distinct.

Larger glumes obtuse or scarcely acute.
  Third glume about half as long as the 4th. Stems from a creeping base ascending to about 1 ft. . . 1. *T. distichophylla.*
  Third glume nearly as long as the 4th and 5th.
    Stems long and weak, at length very long branching and entangled. Outer glumes obtuse, unequal . . . . 2. *T. juncea.*
    Stems erect. Outer glumes acute, nearly equal. Western species . . . . 3. *T. lævis.*
Larger glumes acutely acuminate . . . . 4. *T. acuminata.*

1. **T. distichophylla,** *R. Br. Prod.* 210.—Stems tufted or branching and creeping at the base to a great extent, ascending to from 6 in. to above 1 ft., rather rigid but slender. Leaves chiefly at the base or on decumbent branches, short, almost distichous, slightly hairy. Spike simple or scarcely compound, ¾ to 1½ in. long. Spikelets almost distichous, sessile or nearly so, sometimes clustered in the lower part of the spike, 2½ or at length 3 lines long, glabrous or minutely pubescent. Outer glumes very short thin and faintly nerved, 3rd glume scarcely more than half the length of the spikelet, thin, obtuse and

faintly nerved, 4th and 5th nearly equal, broad, obtuse, 7-nerved, the nerves more prominent on the 4th than on the 5th, 6th glume enclosing the flower narrow, concave, faintly 1-nerved.—Hook. f. Fl. Tasm. ii. 104; *Ehrharta distichophylla*, Labill. Pl. Nov. Holl. i. 90, t. 117.

Victoria. Between Gillibrand and Curdie's Rivers, *F. Mueller*.

Tasmania. Port Dalrymple, *R. Brown*; Hobarton and Penquite, *Gunn*; Southport, *C. Stuart*.

2. **T. juncea,** *R. Br. Prod.* 210.—Stems either long slender and slightly branched or more branched and entangled scrambling over bushes to the height of 8 to 12 ft. (*F. Mueller*). Leaves narrow, glabrous or pubescent with short rigid hairs. Spike or raceme simple, 1 to 2 in. long, the rhachis flexuose. Spikelets distant, sessile or nearly so, 2 to 2½ lines long. Two outer glumes short but unequal, obtuse, faintly nerved; 3rd glume nearly equal to the 4th and 5th, all three obtuse, prominently 3- or 5-nerved, 6th glume enclosing the flower very narrow and hyaline.—*Ehrharta juncea*, Spreng. Syst. ii. 114; *Tetrarrhena tenacissima*, Nees in Hook. Lond. Journ. ii. 409; Hook. f. Fl. Tasm. ii. 104, t. 154; *Ehrharta tenacissima*, Steud. Syn. Glum. i. 7; F. Muell. Fragm. vii. 90.

Victoria. Port Phillip, *R. Brown*; Dandenong Ranges, *F. Mueller*; Mount William, *Sullivan*; Red Jacket Creek, *Gargurevich*.

Tasmania. Moist places near the sea, Black River, *Gunn*.

Var. *scabra*. Leaves very scabrous. Outer glumes rather longer than in the typical form but of the same number, the specimens just coming into flower the 5th glume is still concealed within the 4th.—*Ehrharta uniglumis*, F. Muell. in Trans. Phil. Soc. Vict. i. 111.—Victoria, *F. Mueller*. The plant referred to by F. Muell. l. c. as *E. contexta*, is the typical form of *Tetrarrhena juncea*.

3. **T. lævis,** *R. Br. Prod.* 210.—Stems from a shortly creeping or horizontal rhizome 1 to 2 ft. high. Leaves flat, glabrous and smooth or slightly scabrous. Spike loose, simple or with a few very short branches, 1½ to 3 in. long. Spikelets about 3 lines long, sessile or shortly pedicellate, glabrous. Outer persistent glumes rigidly membranous, rather acute, nearly equal, the lowest slightly the 2nd prominently 5-nerved, 3rd, 4th and 5th glumes nearly similar, obtuse, the nerves faint, disappearing as the glumes thicken, the 3rd rather shorter and more open, the 4th and 5th closely enveloping the grain, the 6th small, narrow and hyaline, faintly 1-nerved.—*Ehrharta lævis*, Spreng. Syst. ii. 115; *Tetrarrhena Drummondiana*, Nees in Hook. Lond. Journ. ii. 409.

W. Australia. King George's Sound, very common, *R. Brown*, *Preiss*, *n.* 1845, *Drummond*, *n.* 394, *Oldfield*, *F. Mueller* and others; Swan River, *Drummond*, *1st. coll.*

4. **T. acuminata,** *R. Br. Prod.* 210.—Stems long and slender. Leaves usually rather longer and broader than in *T. distichophylla*, quite glabrous. Spike 1 to 1½ in. long. Spikelets few, distant, sessile, 3 to

4 lines long. Outer persistent glumes very small as in *T. distichophylla*, but not so obtuse, the lowest about ½ line, the 2nd ¾ line long, 3rd and 4th glumes narrow, rigid, acuminate, with about 5 very prominent scabrous or almost muricate nerves, the 4th rather longer than the 3rd and sometimes produced into a short fine point; 5th glume rather shorter and less acute, rigid but faintly nerved and smooth or nearly so, 6th shorter and narrower, but keeled acute and rather rigid.—Hook. f. Fl. Tasm. ii. 104; *Ehrharta acuminata*, Spreng. Syst. ii. 114.

Victoria. Queen's Cliff, *F. Mueller*.

Tasmania. Port Dalrymple, *R. Brown;* Longford, *Archer*; Mersey River, *C. Stuart*.

44. ALOPECURUS, Linn.

Spikelets 1-flowered, flat, densely crowded into a cylindrical spike or spikelike panicle. Glumes 3, 2 outer complicate, keeled, acute but not awned, 3rd under the flower shorter, keeled, with a short slender dorsal awn. No 2-nerved palea or lodicules. Stamens 3. Styles distinct. Grain enclosed in the scarcely hardened glumes, but free from them.

A small genus, widely spread over the temperate and colder regions of both the northern and the southern hemispheres, only penetrating into the tropics as occasional weeds. The two Australian species are common northern ones, and one of them is only as an introduced weed.

Outer glumes nearly 3 lines long, united at the middle, glabrous or nearly so . . . . 1. *A. agrestis.*
Outer glumes not 1½ lines long, free or scarcely united at the base, hairy on the keel . . . . 2. *A. geniculatus.*

* 1. **A. agrestis,** *Linn.; Kunth, Enum.* i. 23.—An annual, 1 to 2 ft. high. Leaves rather short, with long not very loose sheaths. Spikes 2 to 3 in. long, the spikelets not so closely packed nor so much flattened as in other species, about 3 lines long, usually quite glabrous, the 2 outer glumes united to about the middle, the hairlike awn of the flowering glume projecting 2 or 3 lines beyond them.—Reichb. Ic. Fl. Germ. t. 49.

Tasmania. Swanport, *Story*, evidently introduced.

2. **A. geniculatus,** *Linn.; Kunth, Enum.* i. 24, ii. t. 7.—A perennial or sometimes annual only, glabrous except the spike. Stems usually procumbent at the base, bending upwards at the lower nodes, sometimes only 3 or 4 in., often 1 ft. high or more. Leaves narrow, the upper sheaths broad and loose. Spike 1 to 2 in. long, closely imbricate but slender. Outer glumes hairy on the keel, scarcely pointed, usually but little more than 1 line long, free or scarcely united at the base, the hairlike awn of the flowering glume not projecting

above 1 line beyond them.—Reichb. Ic. Fl. Germ. t. 49; Hook. f. Fl. Tasm. ii. 109; F. Muell. Fragm. viii. 138; *A. australis*, Nees in Hook. Lond. Journ. ii. 412.

Queensland, Darling Downs, *Law*; Ballandool River, *Looker*.
N. S. Wales. In the interior, west of the Blue Mountains, Darling River, etc., *A. Cunningham*, *Mitchell*, *Woolls* and others.
Victoria. Wendu Vale, *Robertson*; Mitta-Mitta, *F. Mueller*; Wimmera, *Dallachy*.
Tasmania. Formosa, *Gunn*.
S. Australia. Spencer's and St. Vincent's Gulfs to the Murray, *F. Mueller* (with longer awns than usual).
W. Australia. Champion Bay, *Oldfield*.

Common in the temperate regions of the northern hemisphere, and as an introduced weed in the southern hemisphere and in some places within the tropics. Perhaps truly indigenous in Australia and New Zealand.

45. PHALARIS, Linn.

Spikelets 1-flowered, flat, densely crowded in an ovoid or cylindrical spike or spikelike panicle, the rhachis of the spikelet articulate above the outer glumes. Glumes usually 6, 2 outer larger ones thin, complicate, 3-nerved, the keel bordered by a scarious wing, the 3rd and 4th small lanceolate or reduced to small bristles or one deficient, the 5th smaller, complicate, very finely 5-nerved or apparently 4-nerved, the central nerve short and scarcely conspicuous enveloping the 6th glume which is also complicate, enclosing the flower, apparently 2-nerved, but the external angle between the nerves longitudinally ciliate. No ordinary palea. Stamens 3. Styles distinct. Grain enclosed in the 2 upper glumes.

A small genus, chiefly from the Mediterranean and neighbouring regions. The two following species are both northern, one of them certainly, the other possibly, introduced into Australia.

Wings of the outer glumes narrow and thin. Intermediate small glumes reduced to a single small bristle . . .	1. *P. minor*.
Wings of the outer glumes rather broad and white. Intermediate small glumes 2, lanceolate, more than ¼ the inner ones	2. *P. canariensis*.

1. **P. minor,** *Retz*; *Kunth*, *Enum*. i. 32.—An erect glabrous leafy annual, of 1 to 2 ft. or rather more, the upper leaf-sheaths loose, the ligula rather large and scarious. Spikelike panicle very dense and compact, from ovoid-oblong and 1 in. long, to oblong-cylindrical and 2 in. long. Spikelets ovate, nearly 3 lines long, the outer glumes very acute, with narrow dorsal wings. Small intermediate glumes reduced to a single short bristle, sometimes quite minute. Inner glumes slightly pubescent, shorter than the outer ones.—Trin. Spec. Gram. t. 79.

Victoria. Melbourne, *Adamson*.
Tasmania. Coal River, *Oldfield*; Swanport, *Story*; Launceston, *Hannaford*.

S. Australia. St. Vincent's Gulf, *Story.*

The species is common in the Mediterranean region and appears in some other countries, but mostly and perhaps in Australia only as introduced. Sibthorp's figure of *P. aquatica*, Fl. Græc. t. 57, usually cited, after Parlatore, for *P. minor*, represents a perennial with a spike twice as long as any I have seen of *P. minor.*

* 2. **P. canariensis,** *Linn.; Kunth, Enum.* i. 31.—An annual like *P. minor*, but usually taller, the spikelike panicle shorter broader and more ovoid. Spikelets much broader, the wings of the outer glumes broader and whiter, the intermediate glumes equal, lanceolate, pubescent, more than half as long as the inner ones and the inner ones much more villous than in *P. minor.*—Sibth. Fl. Gr. t. 55.; Trin. Spec. Gram. t. 74.

S. Australia. Naturalised on the sea-shore at *Bremerhaven*, *Herb. F. Mueller.*

The plant is much cultivated in the Mediterranean region as *Canary-seed*, and is probably a native rather of South Europe or North Africa than of the Canary Islands, but it has now established itself in so many places, especially near the sea, that it is difficult to say where it is really indigenous.

* 46. ANTHOXANTHUM, Linn.

Spikelets 1-flowered, narrow, pedicellate, crowded into a cylindrical spike or spikelike panicle, the rhachis articulate above the 2 outer glumes. Glumes 6, 2 outer acute, keeled, 3rd and 4th shorter, empty, narrow, one with a small dorsal awn, the other with a longer awn free from much lower down, 5th broad, obtuse, hyaline, with 3 very fine nerves, enveloping the 6th, which is narrower, with a very fine central nerve or keel, enclosing the flower. No 2-nerved palea. Stamens 2. Styles distinct. Grain enclosed in the 2 upper glumes.

The genus consists of a single species common in the temperate regions of the northern hemisphere, and introduced into several parts of the southern.

* 1. **A. odoratum,** *Linn.; Kunth, Enum.* i. 38, ii. *t.* 8.—A rather slender erect perennial, 1 to 2 ft. high, quite glabrous. Spikelike panicle 1½ to 2 in. long. Spikelets about 3 lines long, the outer glumes unequal, the 3rd and 4th usually quite included within them or rarely the longest awn slightly protruding.—Trin. Spec. Gram. t. 14; Reichb. Ic. Fl. Germ. t. 106.

N. S. Wales. Port Jackson, *Woolls.*
Tasmania. New Norfolk, *Gunn;* Swanport, *Story.*

A common meadow grass in Europe and northern Asia, giving the sweet scent to hay. In Australia evidently introduced only.

47. HIEROCHLOA, Gmel.

(Disarrhenum, *Labill.*)

Spikelets with 1 terminal hermaphrodite flower and 2 male flowers below it, in a pyramidal or narrow terminal panicle, the rhachis articulate above the 2 outer glumes. Glumes 6, thinly scarious, 2 outer acute keeled with a more or less distinct short nerve on each side, 3rd and 4th obtuse or emarginate, the keel sometimes produced into a short awn, each enclosing a narrow palea and 3 stamens, 5th shorter broad obtuse 5-nerved the keel rarely produced into a short point, enveloping the 6th which is narrower with a central nerve or keel. No 2-nerved palea to the terminal flower. Stamens 2. Styles distinct. Grain enclosed in the 2 upper glumes.

An Arctic and Antarctic genus common to the New and the Old World, extending into more temperate regions in Europe, South Africa, the Himalayas and Mexican mountains. Of the two Australian species one has a wide Antarctic range, the other is endemic. The species have all the sweet hay-scent of *Anthoxanthum.*

Spikelets crowded on the branches of the panicle. Outer glumes as long as the male ones	1. *H. redolens.*
Spikelets all on slender pedicels. Outer glumes shorter than the male ones	2. *H. rariflora.*

1. **H. redolens,** *R. Br. Prod.* 209 (*by reference*).—Stems tufted, erect, branching, leafy, 2 to 3 ft. high. Leaves flat, rather rigid, slightly scabrous, otherwise glabrous, the ligula scarious, entire. Panicle rather dense, secund or nodding, 4 to 10 in. long in the larger forms, the spikelets crowded along the primary branches, forming spikelike secondary panicles of 1 to 1½ in., the upper ones sessile, the lower distant on clustered filiform peduncles. Glumes all thin, almost hyaline, rather shining; outer empty ones in the typical form about 3 lines long, the short lateral nerve on each side more prominent in the 2nd than in the outermost one. 3rd and 4th glumes each with a male flower, nearly as long as the outer ones, ciliate on the margins and keels, with a short awn arising from a little below the tip, the rhachis of the spikelet shortly lengthened between and above the male glumes. 5th and 6th glumes enclosing the grain obtuse and perfectly glabrous, or the 5th slightly hairy at the end with the keel produced into a minute point.—Hook. f. Fl. Tasm. ii. 108; *Holcus redolens*, Forst. Prod. 92; *Melica magellanica*, Desv. in Lam. Dict. iv. 72; *Disarrhenum antarcticum*, Labill. Pl. Nov. Holl. ii. 83, t. 232; *Hierochloa antarctica*, R. Br. Prod. 209; Brongn. in Duperr. Voy. t. 23; Kunth, Rev. Gram. t. 203.

Victoria. Common in the Australian Alps, *F. Mueller.*

Tasmania. Table Mountain (Mount Wellington) *R. Brown.* Common in wet places throughout the island, *J. D. Hooker* and others.

Also in New Zealand and Antarctic America. Among the several specific names Forster's is the oldest and was applied to the typical New Zealand plant, which appears precisely to correspond with the larger Victorian and some of the Fuegian ones. The slight differences pointed out by Brown do not hold good on our specimens. The following two varieties are however much more distinct, and if the differences are confirmed by further specimens they might be restored as distinct species.

Var? *submutica*, F. Muell. Glumes all smaller and more obtuse, those under the male flowers less ciliate and without any or only minute rudimentary awns.—*H.*

submutica, F. Muell. in Trans. Vict. Inst. 1855, 48.—Cobberas and Munyang Mountains, *F. Mueller*.

Var ? *Fraseri*. A smaller plant and more slender than the typical form. Panicle not so dense, usually only 2 to 3 in. long. Pedicels slightly hairy. Spikelets scarcely 2 lines long, the glumes under the male flowers less ciliate, the awns short, but inserted near the apex of the glume.—*H. Fraseri*, Hook. f. Fl. Ant. i. 93; *H. borealis*, Hook. f. Fl. Tasm. ii. 108, scarcely of Schrader, referred to *H. alpina* by Hook. f. Handb. N. Zeal. Fl. 322 and by F. Muell. Fragm. viii. 138.—Mount Wellington, *Fraser*, *Gunn*; Mount Lapeyrouse, *Gulliver*; Mount Field East, *F. Mueller*.

This appears to me to be closely connected with *H. redolens* through the var. *submutica*. It is certainly near the northern *H. borealis*, but has not the loose divaricate panicle nor the broader spikelets of that species. The northern *H. alpina* differs still more in its small compact panicle and in the awns free from much lower down on the male-flower glumes. All however are very near to each other.

2. **H. rariflora,** *Hook. f. Fl. Ant.* i. 93; *Fl. Tasm.* ii. 108. *t.* 157.—Stems slender, branching, 2 to 3 ft. high. Leaves narrower than in *H. redolens*, tapering into long subulate points. Panicle loose and spreading, 2 to 3 in. long. Spikelets all on slender pedicels, often variegated from the contrast of the purplish outer glumes and pale coloured upper ones. Outer persistent glumes broad, obtuse, the lowest about 1½ lines long, the 2nd rather larger and 3-nerved; intermediate male glumes about 2 lines long, rather rigid, 5-nerved, obtuse and awnless, finely and shortly ciliate on the margins and sometimes on the keel, 5th glume very broad, thin, obtuse, glabrous, 5-nerved, 6th much narrower. keeled, but the lateral nerves scarcely visible.—F. Muell. Fragm. viii. 138.

N. S. Wales. Twofold Bay, *F. Mueller*.

Victoria. Nangatta and White Rock Mountains, *F. Mueller*.

Tasmania. Northern parts of the island, *Gunn*; St. Paul's River, *C. Stuart*; Swanport, *Story*; Bay of Fires, *Bissill*.

The King George's Sound station, given on the authority of Baxter's specimen so marked in Herb. Hook. is probably a mistake. Baxter collected chiefly at King George's Sound, Lucky Bay, and along the coast a little to the eastward, but also a few specimens on the coast of Victoria, which got mixed with his other plants in the general designation of King George's Sound.

TRIBE V. STREPTATHERÆ.—Spikelets with 1, 2, or in a few genera several hermaphrodite flowers, and very rarely a male flower above or below, the rhachis of the spikelet usually articulate above 2 outer persistent empty glumes, either not continued beyond the solitary or upper flower, or produced into a short bristle or rarely bearing one or more upper empty glumes. Flowering glume usually bearing a terminal or dorsal bent awn twisted below the bend, but very small and straight or deficient in a few species. Palea usually thin and small, always 2-nerved, minute or deficient in a few species, large and prominently 2-keeled in a few genera. Stamens never more than 3.

Munro is inclined to raise the three subtribes here proposed to the rank of tribes;

it appears to me however that the three together form a group bearing the same relation to Festucaceæ which the Andropogoneæ do to Paniceæ, the chief character residing in the twisted awn and the generally reduced palea. In neither case can any distinct line be drawn without the interposition of one or two exceptional genera or species.

SUBTRIBE I. STIPACEÆ. — Spikelets 1-flowered, paniculate, the rhachis not produced beyond the flower. Flowering glume closely enveloping the palea, with a terminal simple or trifid awn. Lodicules (always?) 3. Grain usually narrow, enclosed in the more or less hardened glume.

48. ARISTIDA, Linn.

Spikelets 1-flowered, on filiform pedicels or nearly sessile in a terminal panicle, the rhachis of the spikelet articulate above the 2 outer glumes. Glumes 3, narrow, 2 outer usually persistent, keeled empty and unawned; terminal or flowering glume narrow, rigid, rolled round the flower, entire, with a terminal trifid awn. Palea small, enclosed in the flowering glume. Styles distinct. Grain narrow, enclosed in the hard upper glume but free from it, the whole falling off with the stipes and awn as in *Stipa*.—All the Australian species glabrous, with convolute more or less subulate leaves.

The genus is widely spread over the tropical and some temperate regions of the New and the Old World. Of the nine Australian species, one, the least spread in Australia, is a common tropical one at least in the Old World, the other eight appear to be endemic. Distinct as are the two sections which are regarded by some as genera, the Australian species of each section run much into each other, and are distinguished by little beyond the proportionate dimensions of the parts of the inflorescence and spikelets.

SECTION I. **Arthratherum.**—*Awn articulate on the glume, entire and spirally twisted below the branches. Flowering glume much shorter than the outer ones.*

Awn 2 to 3 in. long below the branches, which are at least as long . . . . 1. *A. hygrometrica.*
Awn about 1½ in. below the branches, which vary from 1½ to 2½ in. . . . . 2. *A. stipoides.*
Awn ½ to ¾ in. below the branches, which vary from 1 to 3 in. . . . . 3. *A. arenaria.*

SECTION II. **Chætaria.**—*Awn not articulate and divided to the glume into 3 branches, the glume itself when barren sometimes twisted but not the awn. Flowering glume about as long or longer than the outer ones.*

Panicle short broad and dense. Glumes ½ in. long. Awns long . . . . 4. *A. Behriana.*
Panicle-branches very long, at length spreading, with few spikelets on long pedicels. Glumes at least ½ in. long 5. *A. leptopoda.*
Panicle loose, at length pyramidal. Pedicels short. Outer glumes 2 to 3 lines long; flowering glume much longer. Awns short . . . . 6. *A. vagans.*
Panicle narrow, rather loose. Outer glumes as long as the flowering one.
  Glumes scarcely 3 lines. Awns under ½ in. long . . . 7. *A. ramosa.*
  Glumes 4 to 5 lines. Awns ¾ to 1 in. long . . . . . . 8. *A. calycina.*

Panicle narrow, dense. Spikelets sessile and crowded on the short branches. Glumes 3 lines or the flowering rather longer. Awns 4 to 6 lines . . . . 9. *A. depressa.*

SECTION I. ARTHRATHERUM.—Awn articulate on the glume, although usually remaining attached and falling off with it, entire and twisted below the branches. Flowering glume much shorter than the outer ones.

1. **A. hygrometrica,** *R. Br. Prod.* 174.—A glabrous, slender, rigid but brittle grass, branching at the base, 1 to 2 ft. high. Leaves subulate, rigid, with closely appressed sheaths minutely ciliate at the orifice. Panicle narrow, scarcely branched, 6 to 10 in. long without the awns. Spikelets few, on short erect pedicels. Outer glume obtuse, 8 to 9 lines long, prominently 3-nerved or sometimes 4-nerved by the doubling of the outer one; 2nd glume hard and convolute, nearly 1½ in. long, acute, 1-nerved; flowering glume narrow, convolute, glabrous, about 3 lines long on a hairy stipes of 1 to 1½ lines. Awn articulate on the glume, at least 2 in. long below the branches, the middle branch 2½ to 4 in., the lateral ones as long or shorter. Palea a little more than 1 line long. Lodicules at least as long, finely striate at the base.—Beauv. Agrost. t. 8, f. 8; Trin. and Rupr. Gram. Stip. 162.

N. Australia. Arnhem N. Bay, *R. Brown;* Upper Victoria River, *F. Mueller.*

2. **A. stipoides,** *R. Br. Prod.* 174.—Habit and foliage of *A. hygrometrica* but more slender. Panicle long with a slender rhachis, the lower short erect branches usually bearing 2 spikelets, the upper spikelets singly distant on short erect pedicels. Outer glume 1-nerved, about ½ in. long, glabrous or minutely pubescent; 2nd rigid, convolute ¾ in.; flowering glume scarcely smaller than in *A. hygrometrica,* but the awn much finer, about 1½ in. below the branching, the branches 1½ to 2 in. long.—Trin. and Rupr. Gram. Stip. 161; F. Muell. Fragm. viii. 111.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* Gilbert River, *Sullivan;* Nicholson and Upper Victoria Rivers, *F. Mueller;* Port Darwin, *Schultz, n.* 82; Dampier's Archipelago, *Walcot.*

Central Australia. Between Alice Springs and Charlotte Waters, *Giles;* Lake Eyre, *Andrews.*

3. **A. arenaria,** *Gaudich. in Freyc. Voy. Bot.* 407.—Very near *A. stipoides* and reduced to that species by F. Mueller, Fragm. viii. 111, but a smaller plant, the stems usually not above 6 in. below the inflorescence, rarely slender leafy and nearly 1 ft. long. Leaves much finer, almost filiform. Panicle narrow and spikelike, scarcely branched or more frequently reduced to a simple raceme, 3 to 4 in. long without the awns. Outer glumes very narrow and fine-pointed, usually dark coloured, the lowest nearly ½ in. long, the 2nd ¾ in.; flowering glume rather smaller than in *A. stipoides,* the awn under 1 in. and usually ½ to ¾ in. below the branching, the branches very fine, varying

from 1 to 3 in.—Trin. and Rupr. Gram. Stip. 163; *Arthratherum arenarium*, Nees in. Pl. Preiss. ii. 98; *Aristida contorta*,' F. Muell. in Trans. Vict. Inst. 1855, 44.

N. Australia. Nichol Bay, *Mrs. M'Croud.*

Queensland? King's Creek, *Bowman*; a single specimen which seems referrible rather to this than to *A. stipoides.*

N. S. Wales. From the Lachlan and Darling to the western boundary, *Victorian and other Expeditions.*

S. Australia. Cudnaka and Murray Rivers, *F. Mueller*; between Alice Springs and Charlotte Waters, Central Australia, *Giles.*

W. Australia, *Drummond*; York district, *Preiss, n.* 1837; Kalgan River, *Oldfield*; Fraser's Range, *Dempster*; Ningham country, *Monger.*

SECTION II. CHÆTARIA.—Awn not articulate, divided to the glume into 3 branches, the glume itself when barren sometimes twisted but not the awn. Flowering glume about as long or longer than the outer ones.

4. **A. Behriana,** *F. Muell. in Trans. Vict. Inst.* 1855, 44.—Stems ascending, usually under 1 ft. below the inflorescence. Leaves subulate at the end, somewhat dilated at the base and the upper sheaths often rather broad and loose. Panicle dense, 2 to 3 in. long and almost as broad, the spikelets nearly sessile. Outer glumes nearly equal, the lowest fine-pointed, the 2nd usually rather longer than the flowering glume. Flowering glume about ½ in. long; with 3 nearly equal sessile awns fine and above 1 in. sometimes nearly 2 in. long.

N. S. Wales. In the western interior, *A. Cunningham*; Bogan River, *Mitchell*; Maranoa, *Woolls*; on the Macquarie, *C. Moore*; Murrumbidgee, *M'Arthur.*

S. Australia. St. Vincent's Gulf to the Murray River and Lake Hindmarsh, *F. Mueller.*

5. **A. leptopoda,** *Benth.*—Stems rather stout, from scarcely 6 in. to 2 ft. high. Leaves long and subulate, with rather broad loose sheaths. Panicle very loose, 6 in. to 1 ft. long, with numerous long rigidly filiform branches at first erect, at length spreading horizontally, bearing few spikelets on filiform pedicels. Outer glumes unequal, with long points, the longest usually about as long as the flowering glume. Flowering glume 6 to 8 lines long, on a very short scarcely ciliate stipes, with 3 nearly equal sessile awns ½ to 1 in. long. Palea small and rigid.

Queensland. Brisbane River, *Bailey*; Darling Downs, *Leichhardt*; Peak Downs, *Burkitt*; Kennedy District, *Daintree*; Tawomba, *Hartmann.*

N. S. Wales. Glendon and Liverpool Plains, *Leichhardt*; Richmond River, *Herb. F. Mueller.*

6. **A. vagans,** *Cav. Ic.* v. 45, *t.* 471.—Stems slender, erect and 1 to 2 ft. high, or diffuse and much branched. Leaves slender, almost filiform, usually short. Panicle 3 to 6 in. long, at first narrow, at length branching and pyramidal, the pedicels very short. Outer glumes usually dark-coloured, 2 to 3 lines long, the 2nd longer than the lowest,

both with 1 prominent nerve. Flowering glume always longer than the outer ones and often twice as long. Awns sessile, about 4 lines long. Palea very short.—R. Br. Prod. 173; F. Muell. Fragm. viii. 111; *A. ramosa*, Sieb. Agrostoth. n. 55; *A. parviflora*, Steud. Syn. Glum. i. 140 (from the char. given).

Queensland. Brisbane River, Moreton Bay, *F. Mueller;* Rockhampton, *O'Shanesy;* Condamine, *Hartmann.*
N. S. Wales. Port Jackson, *R. Brown*, *Woolls;* New England, *C. Stuart.*

Var. *gracillima.* Stems long, slender and branching; panicle filiform.—Cameroons Brush, *Leichhardt;* Rockhampton, *O'Shanesy.*

Var. *compacta.* Panicle short and compact, but the spikelets and awns quite of *A. vagans.*—Warwick, *Beckler*, *Nernst.*

7. **A. ramosa,** *R. Br. Prod.* 173.—Very nearly allied to *A. calycina*, and almost intermediate between that and *A. vagans.* Panicle narrow, with erect or scarcely spreading branches and the outer glumes as long as the flowering ones or nearly so as in *A. calycina*, but the spikelets much smaller, the glumes scarcely above 3 lines and the awns under ½ in. long.

Queensland. Brisbane River, Moreton Bay, *F. Mueller*, *Bailey;* Rockhampton, *O'Shanesy;* Herbert's Creek, *Bowman;* Darling Downs, *Law.*
N. S. Wales. Port Jackson, *R. Brown;* Liverpool Plains, *A. Cunningham;* New England, *C. Stuart;* Clarence River, *Beckler;* also in *Leichhardt's* collection.

Var. ? *leptathera.* Panicle spreading, awns 1 in. long, but the spikelets of *A. ramosa.*—Dry-Beef Creek, *Leichhardt.*

Var. *compacta.* Panicle short and dense.—Gracemere, *O'Shanesy.*

8. **A. calycina,** *R. Br. Prod.* 173.—Stems tufted, erect, 1 to 2 ft. high. Leaves very narrow, mostly subulate. Panicle narrow, often above 6 in. long, with few short erect branches, rarely at length spreading, each bearing 1 or 2 or the lower ones several but few sessile or shortly pedicellate spikelets. Spikelets in the typical form 4 to 5 lines long without the awns Outer glumes with fine points, the 2nd as long as or longer than the flowering glume. Awns slender, sessile, ¼ to 1½ in. long. Palea rather long.

N. Australia. Upper Victoria River, *F. Mueller;* Port Darwin, *Schultz*, *n.* 765.
Queensland. Keppel Bay, *R. Brown;* Flinders River and Nerkool Creek, *Bowman;* Darling Downs, *Law;* Peak Downs, *Burkitt.*
N. S. Wales. Between the Darling and Cooper's Creek, *Neilson.*
Central Australia. Near Alice Springs, *Giles* (with a looser panicle).

9. **A. depressa,** *Retz;* *Kunth, Enum.* i. 190.—A very variable grass, distinguished by its narrow spikelets crowded and almost imbricate along the short erect branches of a narrow compact panicle. Stems in the Australian specimens ascending or erect, above 1 ft. high. Leaves narrow, ending in subulate points. Panicle from 2 or 3 in. long and spikelike, to 6 or 8 in. and interrupted at the base. Spikelets

sessile along the branches and often purplish. Outer glumes about 3 lines long. Flowering glumes usually longer. Awns sessile, varying from 4 to 6 lines or rather more.—*A. vulgaris*, Trin. and Rupr. Gram. Stip. 131.

Queensland. Peak Downs, *Burkitt.*
N. S. Wales. Hunter's River, *U.S. Exploring Expedition;* also in *Leichhardt's* collection.

Widely spread over tropical and subtropical Asia and Africa and the south Mediterranean region, and probably the same as the tropical American *A. dispersa*, Trin. et Rupr.

49. STIPA, Linn.

Spikelets 1-flowered, on filiform pedicels or nearly sessile in a terminal panicle, the rhachis of the spikelet articulate above the 2 outer glumes. Glumes 3, narrow, 2 outer usually persistent, membranous, keeled, empty, unawned; terminal or flowering glume narrow, rigid, rolled round the flower, with a terminal undivided bent awn spirally twisted below the bend. Palea enclosed in the flowering glume. Lodicules usually large. Anthers usually tipped with a tuft of hairs. Styles distinct. Grain narrow, enclosed in the hard upper glume but free from it.—A short continuation of the rhachis of the spikelet above the articulation forms usually a stipes to the flower and fruit, falls off with it and is usually ciliate with short hairs, the awn is more or less distinctly articulate on the flowering glume, but usually remains attached to it after it falls.

The genus is widely dispersed over the tropical and temperate regions of the New and the Old World. The Australian species, however, belong to the group or section *Nesostipa*, Trin., which is exclusively Australian, one of them only extends to New Zealand, the remaining 14 appear to be all endemic.

Flowering glume glabrous or slightly hairy at the end, very shortly produced into hyaline lobes or entire. Palea very small or rarely half as long as the glume.
  Panicle branches long and plumose. Spikelets 4 to 6 lines long . . . . 1. *S. elegantissima.*
  Panicle very much branched, glabrous or slightly pubescent. Spikelets scarcely 1½ lines long . . 2. *S. micrantha.*
Flowering glume silky-hairy, the hyaline margins at the end produced into a small lobe on each side of the awn. Palea nearly as long as the glume. Panicle narrow and compact.
  Outer glumes acute, under ½ in., usually yellowish brown. Lobes of the flowering glume very small . . . . 3. *S. flavescens.*
  Outer glumes finely pointed, above ½ in. long, white and hyaline. Lobes of the flowering glume more conspicuous . . . . 4. *S. teretifolia.*
Flowering glume silky-hairy, the margins not dilated under the awn. Palea nearly as long as the glume.

Ligula elongated, not ciliate.
  Panicle dense, enclosed at the base in the broad loose upper leaf-sheath. Awn 3 to 5 in. long. Ligula 2 to 4 lines . . . . 5. *S. compressa.*
  Panicle rather loose, at length very long. Awn about 2 in. Ligula rounded, 1 to 2 lines . . 6. *S. Drummondii.*
  Panicle dense and spikelike, 2 to 4 in. long. Awn 1½ to 2 in. Leaves rather long, subulate . . 7. *S. pycnostachya.*
  Panicle loose. Leaves slender, filiform . . . . 8. *S. setacea.*
Ligula short, ciliate. Awn plumose-hairy in the lower part.
  Panicle dense, 6 to 10 in. long. Awn 1½ to 4 in. long, shortly plumose-hairy all round to the bend or higher up . . . . 9. *S. semibarbata.*
  Panicle rather dense, 4 to 5 in. Awn about 1 in., plumose about the middle with long hairs turned to one side . . . . 10. *S. hemipogon.*
Ligula short, ciliate. Awn glabrous or slightly pubescent.
  Lowest glume usually slightly dilated and truncate or toothed at the end. Flowering glume narrow. Panicle dense or at length long and loose . . . . 11. *S. pubescens.*
  Lowest glume usually 3-pointed. Flowering glume rather broad. Panicle very loose . . . . 12. *S. aristiglumis.*
  Lowest glume always fine-pointed.
    Bulbous base of the stem densely woolly. Leaves long, filiform, flexuose . . . . 13. *S. eriopus.*
    Base of the stem and lower leaf-sheaths smooth and shining. Leaves filiform, hispid with spreading hairs . . . . 14. *S. trichophylla.*
    Leaves slender, glabrous or pubescent, the upper sheaths sometimes dilated. Panicle loose . 15. *S. scabra.*

1. **S. elegantissima,** *Labill. Pl. Nov. Holl.* i. 23, *t.* 29.—Stems from a horizontal rhizome erect and branching, rigid though rather slender, 2 to 3 ft. high. Leaves narrow, mostly erect, convolute when dry, glabrous. Panicle very loose, 6 to 8 in. long, at length broadly spreading, the rhachis and long filiform branches elegantly plumose with fine spreading hairs. Outer glumes 4 to 6 lines long, equal or the lowest much shorter, acutely acuminate; flowering glume shorter, on a short hairy stipes but glabrous, the involute margins shortly hyaline at the end and produced into a very short obtuse lobe on each side of the awn. Awn 1 to 1½ in. long or sometimes even longer. Palea less than ½ as long as the glume.—R. Br. Prod. 175; Hook. f. Fl. Tasm. ii. 111; Nees in Pl. Preiss. ii. 99; F. Muell. Fragm. viii. 103.

N. S. Wales. From the Lachlan and Darling to the western boundary, *Victorian and other Expeditions.*

Victoria. Murray and Wimmera Rivers, *F. Mueller.*

Tasmania? *Labillardière,* l. c. Labillardière's specimen from Capt. Baudin in herb. R. Brown is, however, marked 'Nouv. Holl. Sud-Ouest,' and the species has appeared in no other Tasmanian collection.

S. Australia. From the Murray to St. Vincent's and Spencer's Gulfs, *F. Mueller* and others; between Enola and Fowler's Bay, *Richards.*

W. Australia. King George's Sound, *Baxter;* Swan River, *Drummond, 1st coll., also n.* 139, 958, 965; Carnac Island, *Preiss, n.* 1847; Murchison River, *Oldfield.*

2. **S. micrantha,** *Cav.? R. Br. Prod.* 175.—Stems several feet high, not stout but rigid, sometimes spreading or scrambling with the branches in dense clusters, sometimes long and little-branched. Leaves very slender, the sheaths often long and loose, glabrous. Panicle loose but often narrow, from under 6 in. to above 1 ft. long, with very numerous capillary glabrous branches. Spikelets the smallest in the genus, pedicellate on the ultimate branches. Outer glumes linear, very thin, nearly equal, scarcely 1½ lines long. Flowering glume shorter, nearly glabrous, on a very short and ciliate stipes, entire at the top, the awn very slender, about ½ in. long. Palea not above ½ the length of the glume.—Sieb. Agrostoth. n. 82; *S. verticillata,* Nees in Spreng. Syst. Cur. Post. 30; Sieb. Agrostoth. n. 64; *Streptachne verticillata,* Trin. and Rupr. Gram. Stip. 8; *Stipa ramosissima,* Nees in Sieb. Agrostoth. n. 82; Trin. in Mem. Acad. Petersb. ser. 6, i. 74; F. Muell. Fragm. viii. 105; *Streptachne ramosissima,* Trin. and Rupr. Gram. Stip. 7, who refer to it *Urachne ramosissima,* Trin. Gram. Unifl. 173, there very insufficiently described.

Queensland. Brisbane River, *Bailey;* Dawson River, *F. Mueller;* Darling Downs, *Leichhardt;* Warwick, *Beckler.*

N. S. Wales. Port Jackson, *R. Brown, Woolls* and others; Clarence River, *Beckler, Wilcox.*

It appears to me probable that R. Brown was correct in identifying this plant with the *S. micrantha* described and figured by Cavanilles Ic. v. 42, t. 467, although more recent botanists have thought that Cavanilles' description agreed better with the *Dichelachne sciurea;* that author, however, adds to his plate a magnified figure of a flowering glume and awn which is wholly inapplicable to the *Dichelachne,* but agrees well with the present species, which is also well represented (in its rather poor state) by Cavanilles' general figure. The awn is certainly articulate on the glume, and therefore not that of *Streptachne.*

3. **S. flavescens,** *Labill. Pl. Nov. Holl.* i. 24, *t.* 30.—An erect rather slender grass of 1½ to 3 ft., quite glabrous or the lower leaves slightly pubescent. Lower leaves sometimes flat at the base, but all otherwise convolute when dry, very narrow or almost subulate, often rigid. Ligula very short, not ciliate. Panicle narrow and dense, 6 in. to above 1 ft. long, the erect branches and pedicels glabrous. Outer glumes 4 to 6 lines long, acute. Flowering glume on a rather long hairy stipes, scarcely 3 lines long, silky-hairy, the hyaline involute margins ending in a small very thin lobe or tooth on each side of the awn, often difficult to distinguish from the hairs. Awn usually pubescent, 1½ in. long or more. Palea nearly as long as the glume, hairy towards the top.—R. Br. Prod. 175; Hook. f. Fl. Tasm. ii. 110.

Victoria. Yarra River, Port Phillip and Wilson's Promontory, *F. Mueller;* French Island, *Beveridge.*

Tasmania, *Labillardière, Gunn;* Kent's Island, *R. Brown;* King's Island, *Neate.*

S. Australia. Adelaide, *Blandowski;* Fowler's Bay, *Richards.*

W. Australia. King George's Sound, *R. Brown*; also *Drummond*, *4th coll. n.* 377.

Preiss's specimens (from Cape Riche? or from Snake River?) n. 1856, referred by Nees in. Pl. Preiss. ii. 98 to *S. crinita*, Gaudich., appear to me to be also the *S. flavescens*, of which they have the typical inflorescence and foliage. I have not seen the true *S. crinita*, Gaudich. in Freyc. Voy. Bot. 407, from Shark's Bay, but from his short character and from Trinius's description it is probably either this or the following species. Both appear to be sea-coast plants nearly allied to each other. Some specimens in herb. Hook. gathered in Shark's Bay by Milne are also probably one of the two species, but they are old with only the outer glumes persisting and cannot be rightly determined. Sprengel's *S. rudis*, referred by some to *S. crinita*, is the Port Jackson *S. pubescens*.

4. **S. teretifolia,** *Steud. Syn. Glum.* i. 128.—Very closely allied to *S. flavescens*, the stems in dense tufts, 1½ to above 2 ft. high. Leaves long, slender, terete or acicular, sometimes as long as the stem; ligula broad and membranous, entire, decurrent along the margins of the sheath. Panicle narrow, 4 to 8 in. long, not so dense as in *S. flavescens*. Spikelets larger. Outer glumes pale-coloured or whitish, usually above ½ in. long, with scarious tips. Flowering glume much shorter, hairy, the upper hairs long and at length spreading, the terminal lobes on each side of the awn more conspicuous than in *S. flavescens*, though often almost concealed by the hairs. Awn rarely above 1 in. long, minutely pubescent.—F. Muell. Fragm. viii. 104; *Dichelachne stipoides*, Hook. f. Fl. N. Zel. i. 294, t. 66, Fl. Tasm. ii. 112; *Dichelachne setacea*, Nees in Pl. Preiss. ii. 98 (excl. syn.).

Victoria. Western Port, *D'Urville* (*Steudel*),

Tasmania. George Town, forming large tussocks at high water mark, *Gunn*, *C. Stuart*; South Port, *C. Stuart*; Swan Port, *Story*.

W. Australia. Preiss's specimens n. 1854 seem to belong rather to this than to the preceding species.

Also in New Zealand. I have seen no authentic specimens of Steudel's plant, but the character given agrees very fairly with our plant.

5. **S. compressa,** *R. Br. Prod.* 175.—Stems 1 to 2 ft. high but often flowering when under 6 in. Lower leaves with short sheaths and laminæ, the upper ones with long loose broad laminæ, the upper one embracing the base of the panicle; ligula 2 to 4 lines long, acute or bifid, not ciliate. Panicle at first very dense, narrow, at length looser, above 1 ft. long, with rather long erect filiform branches. Outer glumes often above ½ in. long, tapering into fine points. Flowering glume shorter, pubescent, entire. Awn glabrous, very fine, 3 to 5 in. long.

W. Australia. King George's Sound, *Menzies*; Kalgan River, *F. Mueller*; also *Drummond*.

Var. *lachnocolea*. Lower leaf-sheath villous with almost paleaceous hairs.—*Drummond*, *n.* 132.

6. **S. Drummondii,** *Steud. Syn. Glum.* i. 128.—Nearly allied to *S. compressa*, with the same stature and inflorescence. Leaves usually

longer and more rigid, the upper sheath long and broad, embracing the base of the panicle as in *S. compressa*, but the ligula much shorter, broad and rounded and sometimes very short but not ciliate; lower sheaths glabrous or pubescent. Panicle at first dense and short, at length loose and above 1 ft. long. Outer glumes varying in size, but usually smaller than in *S. compressa.* Flowering glume silky-villous. Awn fine, rarely much above 2 in. long.

W. Australia, *Drummond, 4th coll. n.* 378. This species resembles also at first sight the var. *pubescens* of *S. scabra*, but differs in the ligula, the denser narrow panicle and shorter awns.

7. **S. pycnostachya,** *Benth.*—Stems tufted, about 1 ft. high, slightly bulbous at the base. Leaves erect, subulate, glabrous or the lower sheaths slightly pubescent, the upper sheath embracing the base of the panicle but not nearly so much as in *S. compressa;* ligula long and membranous. Panicle compound, but dense and spikelike, 2 to 4 in. long, with very short erect branches, the lower spikelets sometimes reduced to empty glumes. Outer glumes narrow, almost hyaline, produced into fine points, the longest rarely ½ in. long. Flowering glume silky-villous, 1½ lines long, the inflexed margins slightly dilated at the top. Awn slender, glabrous, 1½ to 2 in. long. Palea as long as the glume, hairy at the top.

W. Australia, *Drummond, n.* 121.

8. **S. setacea,** *R. Br. Prod.* 174.—Stems slender, 1 to 2 ft. high or rarely more. Leaves fine and short, tufted at the base of the stem, those on the stem few with long sheaths; ligula elongated, not ciliate, often broken off from dried specimens. Panicle loose, 4 to 10 in. long, glabrous. Outer glumes very thin, narrow, acuminate, 4 to 5 lines long. Flowering glume much shorter, pubescent or villous, entire at the top. Awn glabrous, very fine, 1½ to above 2 in. long. Palea as long as the glume, often hardened when ripe.—Hook. f. Fl. Tasm. ii. 110, t. 157.

Queensland. Warwick, *Beckler.*

N. S. Wales. Port Jackson, *R. Brown;* Castleragh, *Woolls;* New England *C. Stuart*, also in *Leichhardt's* collection; on the Lachlan and Darling, *Burkitt;* Murrumbidgee, *M'Arthur;* Edwards River, *F. Mueller.*

Victoria. Wendu Vale in large patches, *Robertson;* Portland, *Allitt;* Mount M'Ivor, *Blandowski*,

Tasmania. Launceston, *Gunn.*

W. Australia. Blackwood River, *Oldfield;* Champion Bay, *C. Gray*; also apparently *Drummond's n.* 136 (or 961 ?), though the ligula is shorter and jagged.

Var. ? *latifolia.* Taller and stouter, leaves broader, the lower sheaths villous. Panicle dense. Awns very long and fine.—*S. scelerata*, Behr. Herb.

S. Australia. Augusta, *Behr;* Crystal Brook, *F. Mueller;* Murray River, *Blandowski.*

9. **S. semibarbata,** *R. Br. Prod.* 174.—Stems 1½ to near 3 ft. high.

Leaves narrow, convolute, often almost subulate, glabrous or shortly pubescent, the ligula very short and ciliate. Panicle oblong, rather dense, 6 to 10 in. long, with erect branches. Outer glumes 6 to 9 lines long, tapering into very thin long acute points. Flowering glume silky-hairy, scarcely 3 lines long, entire at the top. Awn varying from under 2 in. to near 4 in. long, shortly plumose-hairy to the bend or sometimes nearly to the end.—Hook. f. Fl. Tasm. ii. 110; F. Muell. Fragm. viii. 104.

N. S. Wales. Mudgee, *Woolls*; Berrima, *Mrs. Calvert.*

Victoria. Yarra River, *F. Mueller, Harvey*; Mount M'Ivor, *C. Stuart*; French Island, *Beveridge.*

Tasmania. Port Dalrymple, *R. Brown*; abundant in dry soil throughout the island, *J. D. Hooker.*

S. Australia. Rivoli Bay, *F. Mueller.*

W. Australia. King George's Sound and Kalgan River, *Oldfield*; Swan River, *Drummond*, 1*st coll., also n.* 116 *and* 129.

Var. *campylachne.* Awns rather less plumose, with shorter hairs.—*S. campylachne*, Nees in Pl. Preiss. ii. 99.—Swan River, *Drummond*, 1*st coll., Preiss, n.* 1848.

I have seen two specimens of Preiss's n. 1848, in one the awns are as plumose as in the common *S. semibarbata*, in the other the hairs are much shorter, showing an approach to *S. pubescens.* A specimen of Drummond's in herb. Lindley named by Nees *S. campylachne* has the awns quite glabrous and may be *S. scabra*, but it is in a very imperfect state.

Var. *mollis.* A coarser grass of 2 to 3 ft., the foliage usually softly pubescent, the other characters the same.—*S. mollis*, R. Br. Prod. 174.—Port Jackson, *R. Brown*; Wimmera, *Mrs. Wilson.* Sieber's specimens, Agrostoth. n. 60, probably from Port Jackson, are between the common form and the var. *mollis.*

10. **S. hemipogon,** *Benth.*—A rather slender grass of 1½ to 2 ft. Leaves long, erect, very narrow and convolute, loosely pubescent or at length glabrous, the ligula very short, ciliate. Panicle narrow, rather dense, 4 to 5 in. long, with short erect branches. Outer glumes about 6 lines long, very thin, hyaline, narrow, with long fine points. Flowering glume much shorter, silky-hairy, on a rather long stipes. Awn about 1 in. long, bearded far above the bend, the hairs about the middle long, spreading, all turned to one side. Stamens 3 but often only 1 with a full-grown anther. Palea nearly as long as the glume.

W. Australia, *Drummond, n.* 231, 376. Referred by F. Muell. Fragm. viii. 104 to a variety of *S. semibarbata.*

11. **S. pubescens,** *R. Br. Prod.* 174.—Stems 2 to 3 ft. high, with pubescent nodes. Leaves narrow, convolute, the ligula very short, usually ciliate. Panicle rather loose in the typical form, very loose in some varieties. Outer glumes unequal, the longest about ½ in., scarious at the end and often but not always truncate, notched or 3-toothed, rarely very acute. Flowering glume much shorter, hairy, entire at the top. Awn above 2 in. long, pubescent in the lower part or glabrous. Palea rather long.—Sieb. Agrostoth. n. 59, 66; Hook. f. Fl. Tasm. ii.

110; F. Muell. Fragm. viii. 104; *S. rudis*, Spreng. Syst. Cur. Post. 31; *S. commutata*, Trin. and Rupr. Gram. Stip. 49.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls* and many others; New England, *C. Stuart.*
Victoria. Latrobe River, *F. Mueller.*
Tasmania. Swanport, *Story*; common in dry soils, *J. D. Hooker.*
S. Australia. Cudnaka and Mount Remarkable, *F. Mueller.*

Var.? *effusa.* Panicle very loose and rather long. Spikelets small. Awns long and slender. Approaches *S. scabra*, to which it ought perhaps to be referred.

W. Australia. Ningham country beyond Arrowsmith River, where it covers the whole country, *Monger.*

S. pubinodis, Trin. and Rupr. Gram. Stip. 50, from Tasmania, is referred by Hooker to *S. pubescens*, although the outer glumes are described as all acute and entire, which is very rarely the case in *S. pubescens.*

12. **S. aristiglumis,** *F. Muell. in Trans. Vict. Inst.* 1855, 43, *Fragm.* viii. 103.—Very nearly allied to *S. pubescens*, and should probably be added to its varieties. Habit and foliage the same. Panicle much looser, spikelets smaller, the outer glume usually produced into 1 to 3 fine points, the fruiting glume broader; awn of *S. pubescens* but usually glabrous.

Queensland. Brisbane River, *Bailey*; Darling Downs, *Woolls.*
N. S. Wales. Liverpool plains and Cassilis, *Leichhardt*; Hunter's River, *United States Exploring Expedition.*
Victoria. Murray and Avoca Rivers, *F. Mueller*; Wimmera, *Wilson.*

13. **S. eriopus,** *Benth.*—Bulblike stock and base of the lower leaves densely woolly-villous, the rest of the plant glabrous or the leaves minutely pubescent. Stems slender, 1 to 1½ ft. high. Leaves long, terete, rigidly filiform, very flexuose, the upper ones with long appressed sheaths; ligula very short, ciliate. Panicle narrow and loose, 6 to 10 in. long, with erect filiform branches. Outer glumes narrow, tapering into fine points, the lowest often 9 or 10 lines long, the 2nd shorter. Flowering glume scarcely 3 lines long, slightly hairy, on a long stipes. Awn very slender, glabrous, 3 to 4 in. long. Palea nearly as long as the glume.

W. Australia. Swan River, *Drummond, 1st coll. and n.* 962.

14. **S. trichophylla,** *Benth.*—Stems slender, glabrous, 1 to 1½ ft. high. Leaves tufted at the base of the stem, short and filiform, the sheaths glabrous, rigid, smooth and shining, the lamina hispid with spreading hairs; stem-leaves few with long appressed sheaths; ligula very short and ciliate. Panicle narrow, 6 to 10 in. long, with few filiform branches. Outer glumes very narrow, tapering into fine points, the lowest about ½ in., the 2nd shorter. Awn capillary, under 2 in. long, glabrous or nearly so. Palea nearly as long as the glume.

W. Australia, *Drummond, n.* 122.

15. **S. scabra,** *Lindl. in Mitch. Trop. Austr.* 31.—Stems in the

typical form slender, tufted, 1 to 2 ft. high. Leaves subulate or filiform, rather short, glabrous or slightly pubescent, the upper sheath scarcely dilated; ligula very short, more or less ciliate. Panicle very loose, 6 in. to above 1 ft. long, with long capillary slightly spreading glabrous branches and pedicels. Outer glumes at first almost hyaline, at length, especially in western specimens, often purplish or rigid, tapering into long points, the longest about ½ in. long. Flowering glume about 2 lines long, silky-hairy, entire at the tip. Awn fine, glabrous, 3 in. long or more. Palea nearly as long as the glume.

N. S. Wales. Bogan River, *Mitchell;* between the Lachlan and Darling, *Burkitt*; Murray River, *Dallachy.*
Victoria. Yarra River, *F. Mueller;* Ballarat, *Bacchus.*

The species, distinguished from *S. setacea* by the short fine ligula, from *S. pubescens* by the more slender habit, the outer glumes both with long fine points, and the long fine awns, appears to be very abundant in the desert country and very variable. It is thought by *F. Mueller* and others that it may be the true *S. crinita,* Gaudich., but the maritime station of that plant (Sharks' Bay), and narrow dense panicle, would point rather to *S. flavescens,* or *S. teretifolia.*

The following are among the principal forms in our herbaria besides the typical eastern plant:

Var. *occidentalis.* Spikelets usually rather larger and fewer, but I can see no other difference.—*S. flavescens,* Nees in Pl. Preiss. ii. 99, not of Labill.; *S. tenuifolia* and *S. puberula,* Steud. Syn. Glum. i. 128.

W. Australia. King George's Sound to Swan River, *Drummond, 1st coll. and n.* 220, 379, 391, 960, 963, *Preiss, n.* 1826*;* Stirling Range and Kalgan, *F. Mueller;* Fraser's Range, *Dempster;* Champion Bay, *C. Gray;* Murchison River, *Oldfield;* Ningham country, *Monger.*

Var. *pubescens.* Lower sheaths pubescent, the upper one loose and broad, embracing the base of the panicle almost as in *S. compressa,* but the ligula entirely that of *S. scabra.*—W. Australia, *Drummond, n.* 375 and 973.

Var. *elatior.* Stem 3 to 4 ft. high. Lower sheath pubescent. Leaves broader and not so closely convolute at the base. Panicle long and narrow.—Swan River, *Drummond,* 1*st coll and n.* 959; Murchison River, *Oldfield.*

Var. *striata.* Panicle more dense. Outer glumes more rigid, prominently nerved and scarcely above 4 lines long.—W. Australia, *Drummond, n.* 133; Murchison River, *Oldfield.*

Var. *barbata.* Orifice of the leaf-sheaths densely bearded with long spreading hairs.—W. Australia, *Drummond.*

50. STREPTACHNE, R. Br.

Spikelets 1-flowered, on short filiform pedicels in a narrow terminal panicle, with the structure of *Stipa,* except that the awn is continuous with the end of the flowering glume without any articulation.

The limits and area of the genus are as yet very uncertain. *Orthoraphium Roylei,* Nees in Ann. Nat. Hist. ser. 1. vii. 221, from East India is certainly a congener, and may prove to be the same as the Australian species. Besides that, two or three tropical American plants were first published as species of *Streptachne*, but afterwards removed by Kunth to a section of *Aristida* having the lateral lobes of the awn minute or obsolete.

1. **S. stipoides**, *R. Br. Prod.* 174.—Only known from two very imperfect specimens, one in Herb. Banks, the other in Herb. R. Brown, each consisting of the summit of a stem without leaves, bearing a very slender and loose little-branched panicle of 5 to 6 in. Outer glumes 4 to 5 lines long, tapering into long fine points. Flowering glume narrow, glabrous, tapering into a very fine twisted and bent awn of ¾ in. Stamens 3.

Queensland. Endeavour River, *Banks and Solander*.

SUBTRIBE II. AGROSTIDEÆ.—Spikelets 1-flowered, paniculate, the rhachis articulate above the outer glumes and either not continued beyond the flower or produced into a bristle rarely bearing an empty glume. Awn of the flowering glume terminal or dorsal usually twisted and bent, rarely very small and straight or deficient. Lodicules (always ?) 2. Grain enclosed in the usually thin glume, the palea sometimes minute or deficient usually thin, more exposed than in Stipaceæ, less developed than in most Avenaceæ.

51. PENTAPOGON, R. Br.

Spikelets 1-flowered, numerous in a rather dense much branched panicle, the rhachis of the spikelet articulate above the 2 outer glumes, with a tuft of hairs surrounding the flowering glume and not continued above it. Glumes 3, 2 outer persistent, membranous, acute or shortly pointed. Flowering glume narrow, rolled round the flower, divided at the end into 5 lobes or awns, the central one rigid, at length twisted, continuous with the keel and sometimes slightly dorsal, the lateral ones shorter and straight. Palea narrow, enclosed in the flowering glume. Lodicules 2. Styles short, distinct. Grain enclosed in the glume but free from it.

The genus is limited to the single species endemic in Australia.

1. **P. Billardieri**, *R. Br. Prod.* 173.—An erect annual, from under 1 ft. to above 2 ft. high. Leaves narrow, hairy pubescent or rarely glabrous. Panicle narrow, erect or somewhat nodding, 2 to 6 in. long. Spikelets numerous, nearly sessile on the branches. Outer glumes narrow, varying from 3 to 6 lines long, almost hyaline, with a prominent shortly ciliate keel often produced into a short point. Flowering glume on a very short hairy stipes, the central awn terete, rigid, ½ to 1 in. long, the lateral lobes 2 on each side, much shorter, erect, slightly flattened and 1-nerved.—Hook. f. Fl. Tasm. ii. 112; *Agrostis quadrifida*, Labill. Pl. Nov. Holl. i. 20, t. 22 (the form

figured an exceptionally starved one); *Stipa pentapogon*, F. Muell. Fragm. viii. 106.

Victoria. Wendu Vale, *Robertson;* Ballarat, *Bacchus;* Ararat, *Green.*
Tasmania. Port Dalrymple, *R. Brown;* Hobarton, *Oldfield;* Cheshunt, *Archer;* Launceston, *Gunn;* Swanport, *Story.*
S. Australia. St. Vincent's Gulf, *F. Mueller;* Barossa Range, *Behr.*

Var. *parviflorus.* Outer glumes scarcely 2 lines long, inner glume and awn in proportion.—Recherche Bay, *C. Stuart.*

52. DIPLOPOGON, R. Br.

(Dipogonia, *Beauv.*)

Spikelets 1-flowered, nearly sessile in a dense panicle contracted into an ovoid-globular head, the rhachis of the spikelet articulate above the 2 outer glumes and not continued beyond the flower. Glumes 3, the 2 outer ones persistent, keeled, tapering into fine short straight awns. Flowering glume scarcely raised above the outer ones, with a rigid terminal awn spirally twisted and curved down, and a short straight awn on each side of it. Palea as long as the glume, narrow and hyaline with 2 prominent nerves produced into short awns. Styles distinct. Grain not seen.

The genus is limited to the single species endemic in Australia. It is in many respects nearly allied to *Amphipogon*, among Pappophoreæ, but the essentially twisted awn places it rather in Agrostideæ next to *Pentapogon.*

1. **D. setaceus**, *R. Br. Prod.* 176.—A slender glabrous erect grass of 1 to 2 ft., with the habit and inflorescence of *Amphipogon turbinatus.* Leaves narrow. Spikelike panicle or head ovoid-globular, ½ to ¾ in. long without the awns. Outer glumes narrow, glabrous or minutely pubescent, 3 to 4 lines long, tapering into fine awns nearly or quite as long, especially the lowest one. Flowering glume slightly hairy, the central awn very rigid and thickened at the base, nearly as long as the awns of the outer glumes, but spirally twisted and curved down so as to appear much shorter, or very frequently curled round the 2nd glume, usually conspicuous from its whiteness in contrast with the purple outer glume; lateral lobes or awns short and erect, as well as the 2 awnlike lobes of the palea.—Nees in Pl. Preiss. ii. 102; *Dipogonia setacea*, Beauv. Agrost. 125.

W. Australia, King George's Sound and neighbouring districts, *R. Brown, Drummond, n.* 262, *Preiss, n.* 1853, *Oldfield.*

53. DICHELACHNE, Endl.

Spikelets 1-flowered, numerous in a narrow usually dense panicle, the rhachis of the spikelet articulate immediately above the 2 outer glumes and not continued beyond the flower. Glumes 3, narrow, the 2 outer ones persistent, membranous, acute, keeled. Flowering glume raised on a short hairy stipes (rhachis of the spikelet), membranous at the time of flowering, hyaline and entire or 2-lobed at the end, with a fine scarcely twisted dorsal awn a little below the end, slightly hardened round the fruit. Palea 2-nerved. Stamens 3 or fewer; anthers glabrous. Styles distinct. Grain enclosed in the glume and palea, free from them.

The genus is probably limited to the two Australian species which extend to New Zealand.

Panicle very dense, the awns above 1 in. long, very numerous and concealing the spikelets	1. *D. crinita.*
Panicle rather loose, the awns 6 to 8 lines long	2. *D. sciurea.*

1. **D. crinita,** *Hook. f. Fl. N. Zel.* i. 293, *Fl. Tasm.* ii. 111.—Stems 2 to 3 ft. high. Leaves flat, glabrous or softly pubescent, the upper ones rather long with long sheaths. Panicle very dense and spikelike, 4 to 8 in. long, the spikelets imbricate on the short erect branches but concealed by the numerous long hairlike awns. Outer glumes very narrow, hyaline with a slightly scabrous keel, nearly equal, about 2½ lines long. Flowering glume shorter, glabrous, the hyaline tip entire but readily splitting. Awn dorsal, very slender, bent but scarcely twisted, above 1 in. long.—*Anthoxanthum crinitum,* Linn. f. Suppl. 90; Labill. Pl. Nov. Holl. ii. 115, t. 263; *Agrostis crinita,* R. Br. Prod. 170; *Muehlenbergia crinita,* Trin. Gram. Unifl. 193; *M. mollicoma,* Nees in Hook. Lond. Journ. ii. 414; *Dichelachne Hookeriana, D. Forsteriana, D. comata* and *D. longiseta,* Trin. and Rupr. Gram. Stip. 3 to 5 (from the descr. and references); also Sieb. Agrostoth. n. 86.

Queensland. Moreton Bay, *Leichhardt;* Armidale, *Perrot.*

N. S. Wales. Port Jackson, *R. Brown, C. Moore* and others; North of Bathurst, *A. Cunningham;* Newcastle, *Leichhardt;* Clarence River, *Beckler, C. Moore;* Lord Howe's Island, *C. Moore.*

Victoria. From the Yarra to the western frontier, *F. Mueller, Robertson* and others.

Tasmania. Port Dalrymple, *R. Brown;* abundant throughout the island, *J. D. Hooker, Labillardière* and others.

S. Australia. Round St. Vincent's Gulf, *F. Mueller, Behr.*

W. Australia. King George's Sound, *R. Brown,* to Swan and Murchison Rivers, *Oldfield, Drummond, n.* 118, 130, 131, 380, and others.

The species is also in New Zealand.

2. **D. sciurea,** *Hook. f. Fl. N. Zel.* i. 294, *Fl. Tasm.* ii. 111, *t.* 158 A.—Stems densely tufted, slender, 1 to 1½ rarely 2 ft. high, quite glabrous, the nodes usually dark-coloured. Leaves short, chiefly at the base of the stem, scabrous-pubescent or glabrous. Panicle narrower and looser than in *D. crinita,* 3 to 6 in. long, the rhachis and filiform branches scabrous. Outer glumes very narrow, about 2½ lines long, the outermost rather shorter than the 2nd. Fruiting glume rather more rigid than in *D. crinita* and minutely pitted-rugose. Awns 6 to 8

lines long, not nearly so crowded as in that species.—*Agrostis sciurea*, R. Br. Prod. 171; Sieb. Agrostoth. n. 63; *Muehlenbergia ciurea*, Trin. Gram. Unifl. 193; *Agrostis rara*, Nees in Sieb. l. c. n. 70; *Dichelachne Sieberiana* and *D. vulgaris*, Trin. and Rupr. Gram. Stip. 2, 3; *D. montana*, Endl. Prod. Fl. Norf. 20 (from the character as revised by Trinius, Gram. Stip. 1).

N. S. Wales. Port Jackson, *R. Brown* and others; New England, *C. Stuart*.

Victoria. Loddon River and Wilson's promontory, *F. Mueller*.

Tasmania. Port Dalrymple, *R. Brown*; abundant throughout the island, *J. D. Hooker*.

W. Australia? *Drummond, n.* 964, may possibly be this species, but more probably one of the poorer forms of *D. crinita*, which approach it very nearly.

Agrostis rara, R. Br. Prod. 171, from Port Jackson, appears to me to be a slight variety of *D. sciurea* with a looser panicle and and fewer spikelets.

Var. *setifolia*. Very slender, with almost filiform leaves, the sheaths scabrous.—Paramatta, *Woolls*.

The species is also in New Zealand, and in Norfolk Island (Herb. Oldfield); Endlicher describes the awn as terminal between the two terminal lobes of the glume, but Trinius who saw Bauer's original specimen describes it as dorsal.

54. AGROSTIS, Linn. partly.

(Agrostis *and* Trichodium, *Nees*.)

Spikelets small, 1-flowered, pedicellate in a loose spreading or narrow panicle, the rhachis of the spikelet articulate above the outer glumes, glabrous or nearly so, not produced beyond the flower. Glumes 3, 2 outer empty ones narrow, keeled, acute, unawned. Flowering glume shorter, broad, thin, enveloping the flower, unawned or with a dorsal awn, attached below the middle, fine and twisted. Palea not above half the length of the glume, very thin and hyaline, often very minute or none. Styles very short, distinct. Grain enclosed in the glume, free from it.

The genus as now limited is still very generally spread over the temperate and some warmer regions of both hemispheres. Of the four species here enumerated one is introduced only, another is also in New Zealand, a third appears to be identical with a common North American one, the 4th alone is strictly endemic.

Palea about half the length of the glume (**Euagrostis**).
  No awn . . . . 1. *A. alba*.
Palea none or rudimentary (**Trichodium**).
  No awn. Outer glumes above 1 line long. Panicle narrow . . . . 2. *A. Muelleri*.
  No awn. Outer glumes about ¾ line. Panicle spreading 3. *A. scabra*.
  Awn nearly basal. Outer glumes about 1 line. Panicle spreading . . . . 4. *A. venusta*.

* 1. **A. alba,** *Linn.; Kunth, Enum.* i. 219.—A tufted perennial, from under 6 in. to above 1 ft. high. Leaves flat, narrow. Panicle pyramidal, sometimes rather loose and spreading, sometimes narrow and more dense. Spikelets very numerous. Outer glumes, narrow, keeled, acute, about 1 line long. Flowering glume shorter, broad, obtuse or truncate, rolled round the flower, unawned. Palea very thin and hyaline, about half as long as the glume.

A common European grass, now said to be naturalised in a few stations in **Victoria,** *F. Mueller,* and **Tasmania,** *Story, C. Stuart, Hannaford.*

2. **A Muelleri,** *Benth.*—A densely tufted grass, our specimens 2 to 6 in. high. Leaves very narrow. Panicle narrow, though rather loose, 1 to 1½ in. long, with short erect capillary branches. Spikelets purplish. Outer glumes very pointed, about 1¼ lines long, glabrous or the keel minutely ciliate. Flowering glume much shorter, thin and hyaline, obtuse, enveloping the flower and grain, without any (or a minute and rudimentary?) palea. Stamens 3.—*A. gelida,* F. Muell. in Trans. Vict. Inst. 1855, 43, not of Trin.; *A. canina,* var. Hook. f. Handb. N. Zeal. Fl. 328.

Victoria. Cobberas Mountains and Mount Kosciusko, at an elevation of 5000 to 6000 ft. *F. Mueller.*

Also on high mountains in New Zealand.

3. **A. scabra,** *Willd. Spec. Pl.* i. 370.—Stems slender, tufted, 6 in. to above 1 ft. high. Leaves very narrow, almost filiform in the typical form, chiefly at the base of the stem. Panicle compound, very loose and slender, with spreading capillary branches. Outer glumes narrow, keeled, rather acute, about ¾ line long. Flowering glume shorter, hyaline, broad and enveloping the flower, obtuse truncate or slightly jagged, unawned. Palea none (or very minute?). Stamens 3. —*A. parviflora,* R. Br. Prod. 170; Hook. f. Fl. Tasm. ii. 113, t. 158; *A. intricata,* Nees in Hook. Lond. Journ. ii. 413; *Trichodium laxiflorum,* Mich. Fl. Bor. Am. i. 42, t. 8; *Agrostis laxiflora,* Richards; Kunth, Rev. Gram. t. 130.

Tasmania. Adventure Bay, *Herb. R. Brown;* common in shady places, *J. D. Hooker, C. Stuart.*

Var. *elatior.* Taller, leaves flatter and flaccid, panicle very loose and spreading.

N. S. Wales. Nattai, *Mrs. Calvert;* New England, *C. Stuart.*

Victoria. Dandenong Ranges, Broken River, sources of the Goulburn, *F. Mueller;* Portland, *Allitt.*

This has been identified by Munro with a common North American species which has a wide range and has been published under various names, of which Willdenow's has the right of priority, except perhaps a very inappropriate one of Fraser's.

4. **A. venusta,** *Trin. in Mem. Acad. Petersb. ser.* 6, vi. 340.—A slender tufted grass closely resembling the typical form of *A. scabra*

with still finer leaves. Panicle loose with long capillary branches, or contracted in some of the smaller specimens. Outer glumes very acute, about 1 line long. Flowering glume shorter, broad hyaline and remarkably truncate, enveloping the flower, with a dorsal twisted awn, affixed very near the base and protruding beyond the outer glumes. Palea none.—Hook. f. Fl. Tasm. ii. 113, t. 159.

Victoria. Ararat, *Green*; Ballarat, *Mrs. Glendinning.*
Tasmania. Abundant in dry grassy places, *J. D. Hooker* and others.
W. Australia. Perongerup, *F. Mueller*; Blackwood River, *Walcot.*

55. DEYEUXIA, Clarion.

(Bromidium, *Nees.*)

Spikelets 1-flowered, pedicellate or rarely sessile in a panicle either loose and spreading or narrow and spikelike, the rhachis of the spikelet articulate above the outer glumes, usually bearing a tuft of hairs round the flowering glume and usually produced beyond it in a small ciliate or rarely glabrous bristle very rarely bearing an empty glume or imperfect flower, sometimes very minute, rarely deficient. Glumes 3, 2 outer ones persistent, keeled, unawned; flowering glume shorter and very thin, about as long or rarely longer and membranous, broad, enclosing the flower, 5-nerved, with a fine dorsal awn usually bent and twisted, rarely short and straight or very rarely deficient. Palea thin, more than half as long as the glume, faintly or prominently 2-nerved. Styles distinct, short. Grain enclosed in the glume and palea and sometimes partially adhering to them.

A considerable genus, spread over the warmer and temperate regions both of the New and the Old World. Of the fifteen Australian species three are also in New Zealand, the remainder are apparently all endemic. They are frequently regarded as forming a section of *Agrostis*, from which they differ chiefly in the more developed palea and in the usual presence of the bristle continuing the rhachis of the spikelet, whilst others again refer *Deyeuxia* to the supposed distinct tribe *Arundineæ*, on account of the hairs surrounding the flowering glume. But these hairs are present in almost all species of *Agrostis*, and although in many species of *Deyeuxia* they are longer, yet they are never so long as in *Calamagrostis*, a northern genus closely allied both to *Agrostis* and to *Deyeuxia*, and equally referrible to Agrostideæ, whilst *Arundo* and *Phragmites* would appear to be much better placed in Festucaceæ. The bristle continuing the rhachis behind the palea, though the character generalty relied on for separating *Deyeuxia* from *Agrostis* and constant in most species, is usually but not constantly wanting in *D. quadriseta* and its allies, distinguished by Nees under the name of *Bromidium*, but evidently very closely connected with other species where the bristle is constant.

Flowering glume very thin, almost hyaline, much shorter than the empty ones.
  Panicle loose and spreading or in smaller plants narrow.
    Rhachis of the spikelet produced into a hairy bristle.
  Spikelets about ½ line long, unawned . . . . . . 1. *D. æquata.*

Spikelets 1½ to 2 lines long. Flowering glume usually hairy truncate or shortly toothed, the awn about the middle. Panicle spreading . 2. *D. Forsteri.*

Spikelets about 3 lines. · Outer glumes with long points. Flowering glume of *D. Forsteri.* Panicle narrow . . . . 3. *D. Drummondiana.*

Spikelets about 3 lines. Flowering glume glabrous with 2 long points, the awn almost basal. Panicle spreading . . . . 4. *D. Billardieri.*

Spikelets about 1½ lines. Flowering glume hairy, with 2 long points, the awn almost basal. Panicle narrow . . . . 5. *D. plebeia.*

Panicle dense and spikelike or shortly branched. Rhachis of the spikelet produced into a glabrous or minute bristle or not continued beyond the flower.

Spikes 2 to 2½ lines long. Awn almost basal. Bristle of the rhachis conspicuous . . . . 6. *D. montana.*

Spikelets 1½ to 2 lines. Awn almost basal. Bristle of the rhachis minute or none . . . 7. *D. quadriseta.*

Spikelets about 3 lines. Awn almost basal. Bristle of the rhachis minute or none . . . 8. *D. cylindrica.*

Spikelets about 2 lines. Awn above the middle of the back. Bristle of the rhachis minute or none . . . . 9. *D. minor.*

Flowering glume nearly or quite as long as the outer ones, membranous, often minutely scabrous or pubescent.

Panicle dense and spikelike. Awn dorsal about the middle of the flowering glume . . . . 10. *D. densa.*

Panicle very loose and long. Awn dorsal about the middle of the flowering glume but very deciduous . . . . 11. *D. frigida.*

Panicle very loose. Awn very small and straight above the middle of the flowering glume or reduced to a small point near the summit . . . 12. *D. scabra.*

Panicle dense and spikelike. Leaves broad. Awn small and straight near the summit of the flowering glume . . . . 13. *D. nivalis.*

Flowering glume twice as long as the truncate outer ones. Spikelets very small in a loose panicle, awnless or with a minute point on the flowering glume.

Outer glumes prominently keeled, rather acute. Stems under 6 in. . . . . 14. *D. Gunniana.*

Outer glumes not keeled, truncate. Stems 1 to 1½ ft. . . . . 15. *D. breviglumis.*

1. **D. æquata,** *Benth.*—A weak glabrous grass of 1 to 2 ft. with the aspect of *Agrostis scabra.* Leaves flaccid, narrow but flat. Panicle very loose, 6 to 9 in. long, with numerous capillary spreading branches in regular distant whorls, or the upper ones in twos or threes. Spikelets numerous, pedicellate, smaller even than in *Agrostis scabra.* Outer glumes narrow, rather acute, but little more than ½ line long. Flowering glume shorter, broad, truncate, thinly membranous, glabrous, unawned, surrounded by a few hairs. Palea narrow. Rhachis produced into a

bristle ciliate with a few long hairs.—*Agrostis æquata*, Nees in Hook. Lond. Journ. ii. 412; Hook. f. Fl. Tasm. ii. 114, t. 159.

Tasmania, *Gunn*, the precise station not indicated.

2. **D. Forsteri,** *Kunth, Enum.* i. 244.—A common grass, very variable in habit, usually erect or decumbent, 1 to 2 ft. high or rather more, with flat rather flaccid leaves, but sometimes smaller with convolute or fine almost filiform leaves. Panicle usually very loose and spreading when fully out, 6 in. to 1 ft. long, with long capillary divided branches in distant whorls or clusters. Spikelets very numerous. Outer glumes narrow, very pointed, 1 to 1½ lines long or in some varieties nearly 2 lines. Flowering glume about half as long, thin and almost hyaline, broad, enveloping the flower, truncate or very shortly and unequally 2- or 4-toothed, sprinkled or densely covered with hairs on the back, rarely almost glabrous, surrounded by the hairs of the rhachis, with a fine twisted awn attached about the middle of the back. Palea very narrow. Rhachis produced into a bristle usually very short and ciliate with a few long hairs.—*Agrostis Forsteri*, Rœm. and Schult. Syst. ii. 359; *A. æmula*, R. Br. Prod. 172; Hook. f. Fl. Tasm. ii. 115; *A. retrofracta*, Willd. Enum. Hort. Berol. 94; *Lachnagrostis retrofracta*, Trin. Fund. Agrost. 128; *L. Willdenowii*, Trin. Gram. Unifl. 217; *Calamagrostis æmula* and *C. Willdenowii*, Steud. Syn. Glum. i. 192; *Agrostis debilis*, Poir. Dict. Suppl. i. 249 (from the descr. confirmed by Kunth); *A. Solandri*, F. Muell. Veg. Chath. Isl. 60; *A. semibarbata*, Trin. in Mem. Acad. Petersb. ser. 6. vi. 378 (from the char. given.)

Queensland. Warwick, *Beckler;* Darling Downs, *Woolls.*

N. S. Wales. Port Jackson, *R. Brown*, *Sieber* (Agrostoth. n. 81); in the interior north of Bathurst, *A. Cunningham;* New England, *C. Moore*, *C. Stuart;* Clarence River, *Wilcox;* Lord Howe's Island, *Fullagar*, the latter with rather longer outer glumes, but all the above with the normal very hairy flowering glume.

Victoria. Wendu Vale, *Robertson;* Melbourne and neighbouring districts, *F. Mueller* and others.

Tasmania. Port Dalrymple, *R. Brown;* abundant throughout the island, *J. D. Hooker* and others.

S. Australia. Around St. Vincent's Gulf, *F. Mueller* and others.

W. Australia. From Esperance Bay to King George's Sound and Swan River, *Dempster*, *Oldfield*, *Walcot*, *Drummond.*

Var. *aristata.* Outer glume produced into long points.—Swan River, *Priss;* Murchison River, *Oldfield.*

Var. *Preissii.* Spikelets of the var. *aristata*, but a smaller plant with fine leaves.—*Lachnagrostis Preissii*, Nees in Pl. Preiss. ii. 97.—W. Australia, Preiss, n. 1841.

Var. *laviglumis.* Flowering glume nearly glabrous except marginal cilia.—Lake George, N. S. Wales, *Fraser*, *A. Cunningham;* Wendu Vale, Victoria, *Robertson;* and with the glume quite glabrous but without the long points of *D. Billardieri*, Red Jacket Creek, *Gargurevich;* Ararat, *Green.*

The species was originally published by Forster for the New Zealand plant under the name of *Agrostis filiformis*, but as that name was then preoccupied it was changed by Gmelin to *A. avenacea*, and more appropriately by Rœmer and Schultes to *A. Forsteri.* Trinius in transferring the plant to *Lachnagrostis* adopted for the specific name first that of *filiformis*, then that of *Forsteri*. Kunth in fixing the species in *Deyeuxia* took the name of *Forsteri* as leading to the least confusion and which it seems advisable on all accounts to retain. Brown, whilst recognising the close affinity of the Australian to the New Zealand plant, thought nevertheless that it might be distinct and gave it the name of *A. æmula*, but already (though not to the knowledge of Brown) it had been raised in Continental Gardens from Australian seeds and published by Willdenow as *A. retrofracta* and by Poiret as *A. debilis*, and Kunth without means of comparison, entered both *æmula* and *retrofracta* as Australian species of *Deyeuxia* distinct from the New Zealand one. As it has now been found necessary to reunite the Australian with Forster's plant, it necessarily merges in the name of *D. Forsteri*, nor can I see any advantage in the entirely new name proposed by F. Mueller.

3. **D. Drummondiana,** *Benth.*—Stems erect, 1 to 2 ft. high, leafy to the panicle, the leaves narrow with rather broad sheaths as in *D. Billardieri*. Panicle narrow, rather dense, 4 to 8 in. long, the branches capillary, but erect or scarcely spreading, in distant whorls. Outer glumes narrow, at least 3 lines long and tapering into long points almost awned, the lowest rather shorter than the other. Flowering glume about 1 line long, hairy, shortly and unequally 4-toothed, the awn fixed about the middle of the back, twisted and projecting beyond the outer glumes. Palea small and narrow. Rhachis produced into a short ciliate bristle almost concealed by the hairs surrounding the glume.—*Dichelachne Drummondiana*, Steud. Syn. Glum. i. 120.

W. Australia, *Drummond, n.* 371.

4. **D. Billardieri,** *Kunth, Enum.* i. 244.—Stems sometimes very short and tufted, usually about 1 ft. high or more, leafy to the inflorescence, which is usually enclosed at the base in the broad sheath of the upper leaf. Panicle when fully out often nearly 1 ft. long though sometimes much smaller, with long capillary divided branches in regular whorls. Outer glumes very narrow and pointed, about 3 lines long. Flowering glume not half so long, quite glabrous, with 2 narrow pointed teeth, the dorsal awn attached much below the middle and rather longer than the outer glumes. Palea shorter and narrow. Rhachis produced into a hairy bristle.—*Avena filiformis*, Labill. Pl. Nov. Holl. i. 24, t. 31; *Agrostis Billardieri*, R. Br. Prod. 171; Hook. f. Fl. Tasm. ii. 115.

N. S. Wales. Port Jackson, *R. Brown;* Clarence River, *Wilcox.*
Victoria. Portland, *Allitt;* Port Phillip, *Harvey.*
Tasmania. *Gunn;* King's Island, *Neate.*
S. Australia, *Behr.*

Also in New Zealand. This is evidently the plant figured by Labillardière, although his herbarium contained also the *D. Forsteri*.

5. **D. plebeia,** *Benth.*—A slender tufted erect grass of 6 to 10 in., apparently annual. Leaves very narrow, almost filiform. Panicle narrow but loose, 2 to 4 in. long, the filiform branches scattered or in twos or threes, erect or slightly spreading. Outer glumes very narrow and pointed, under 1¼ lines long. Flowering glume thin and hairy,

about half as long but with 2 fine teeth or lobes almost as long as the outer glumes. Awn attached very near the base, exceeding the outer glumes. Palea small and narrow. Rhachis produced into a minute hairy bristle almost concealed in the hairs surrounding the glume.—*Agrostis plebeia*, R. Br. Prod. 172; *Didymochæta australis*, Steud. Syn. Glum. i. 185.

N. S. Wales. Port Jackson, *R. Brown.*
S. Australia. Crystal Brook, *F. Mueller.*
W. Australia, *Drummond, n.* 223 *and* 370.

6. **D. montana,** *Benth.*—Stems from under 1 ft. to above 2 ft. high. Leaves in the smaller specimens very narrow almost subulate, in the larger ones flat and 2 to 3 lines broad. Panicle dense and spike-like or slightly branched and interrupted at the base, 2 to 4 in. long. Spikelets crowded on the short erect branches. Outer glumes narrow, very acute, rather rigid, 2 to 2½ lines long. Flowering glume short, glabrous, shortly 2- or 4-toothed, the awn attached much below the middle and exserted. Palea smaller. Rhachis bearing but few short hairs and produced into a glabrous or slightly hairy bristle, either very short or lengthened and occasionally bearing an empty glume or imperfect flower.—*Agrostis montana*, R. Br. Prod. 171; Hook. f. Fl. Tasm. ii. 116.

Victoria. Moyston, *Sullivan.*
Tasmania. Table Mountain (Mount Wellington), *R. Brown;* common on the mountains, *J. D. Hooker;* South Esk River, *C. Stuart.*
S. Australia. Lofty and Bugle Ranges, *F. Mueller.*

7. **D. quadriseta,** *Benth.*—A glabrous and smooth or scabrous erect perennial, very variable in stature, usually 1 to 3 ft. high. Leaves narrow, erect or spreading, flat or convolute when dry. Panicle dense and spikelike, varying from 1½ or 2 in. to 8 or 10 in. long, when small closely cylindrical, when large more branched, but the spikelets always densely crowded from the base of the short erect branches. Outer glumes narrow, very acute, with a scabrous or minutely ciliate keel, the sides smooth, 1½ to near 2 lines long. Flowering glume shorter, broad hyaline and rolled round the flower, the 2 nerves on each side more or less produced into acute teeth or points. Awn attached much below the middle or close to the base, usually not much longer than the outer glumes. Palea narrow. Rhachis of the spikelet hairy round the flower, produced sometimes into a minute bristle which however appears to be generally deficient.—*Avena quadriseta*, Labill. Pl. Nov. Holl. i. 25, t. 32; *Agrostis quadriseta*, R. Br. Prod. 171; Trin. Spec. Gram. t. 33; Hook. f. Fl. Tasm. ii. 114; *A. lobata*, R. Br. l. c.; *A. diaphora*, Trin. in Mem. Acad. Petersb. ser. 6, vi. 366; *Bromidium quadrisetum*, Nees in Hook. Lond. Journ. ii. 416; *B. lobatum*, Nees, l. c. 415.

S. Wales. Paramatta, *Woolls;* New England, *Perrott;* head of the Gwydir, *Leichhardt.*
Victoria. Numerous localities from the Murray and Yarra to Gipps' Land, *F. Mueller* and others.

Tasmania. Port Dalrymple, *R. Brown*; abundant throughout the island, *J. D. Hooker* and others.

S. Australia. From the hills about St Vincent's Gulf to the Murray, *F. Mueller* and others.

W. Australia. Blackwood and Tweed Rivers, *Oldfield*; Warren River, *Walcot*; Swan River, *Helmich*.

Also in New Zealand.

8. **D. cylindrica,** *Benth.*—A tufted grass of 6 to 10 in. Leaves narrow but flat. Panicle 1 to 1¼ in. long, dense and spikelike but much looser than in *D. quadriseta*. Spikelets much fewer than in that species, sessile on the short branches. Outer glumes narrow, acutely acuminate, about 3 lines long or the lowest rather shorter, the keel minutely ciliate. Flowering glume much shorter, broad and thin, glabrous or slightly hairy, entire or shortly 2- or 4-toothed. Awn attached below the middle and shortly protruding from the outer glume. Palea not much shorter than the glume. Rhachis produced into a minute bristle or more frequently not perceptibly continued beyond the flower.—*Agrostis cylindrica*, R. Br. Prod. 171; *Pentapogon Drummondii*, Steud. Syn. Glum. i. 193.

W. Australia. King George's Sound, *R. Brown*; towards Cape Riche, *Drummond, 5th coll. n.* 448; Perongerup, *F. Mueller.*

9. **D. minor,** *Benth.*—Usually smaller and more slender than *D. quadriseta*, the stems 6 in. to above 1 ft. high. Spikelike panicle 1 to 2 in. long, not nearly so dense as in *D. quadriseta*, often purplish. Outer glumes about 2 lines long, very acute. Flowering glume short and broad, finely 4-pointed. Awn affixed above the middle of the back, shortly exceeding the outer glumes. Palea narrow. Rhachis hairy round the flowering glume, not perceptibly produced beyond it in the spikelets examined, but probably occasionally with the minute bristle of the two preceding species.—*Agrostis quadriseta*, var. *minor* or *A. minor*, F. Muell. Herb.

Victoria. Grampian Range and Wilson's Promontory, *F. Mueller.*

Tasmania. Southport, *C. Stuart.*

10. **D. densa,** *Benth.*—Stems 1 to 1½ ft. high. Leaves narrow, flat. Panicle dense and spikelike or slightly lobed, 2 to 3 in. long. Spikelets crowded on the short erect compound branches. Outer glumes keeled, with scarious sides, 1½ lines long, rather acute. Flowering glume nearly as long, acuminate, entire but prominently 4-nerved above the awn, glabrous, membranous, but rather firm when in fruit and very minutely scabrous-rugose, the awn about the middle of the back, twisted and exserted. Palea shorter, very thin. Rhachis with rather long hairs surrounding the glume and produced into a rather long hairy bristle.

Victoria. Wilson's Promontory, Maroka Valley and the Yarra River, *F. Mueller.*

S. Australia. Lofty Ranges and Onkaparinga, *F. Mueller.*

11. **D frigida,** *F. Muell.*—Stems weak and general habit of *D. scabra,* but usually taller, attaining sometimes 4 or 5 ft. Panicle as in that species long and loose with scattered branches. Spikelets rather larger. Outer glumes very acute, 2 lines long or rather more. Flowering glume not much shorter, 5-nerved, nearly smooth or slightly scabrous in fruit, with a fine twisted awn attached a little above the middle and very deciduous, leaving usually on the fruiting glume a small dorsal notch.—*Agrostis frigida,* F. Muell. Herb.

Victoria. Mount Buller, *F. Mueller,* the specimens past flower showing only the persistent outer glumes, the very few fruiting glumes remaining have lost their awns only showing the dorsal notch terminating the midrib halfway up.
Tasmania, *Oldfield;* New Norfolk, *Gunn.*

12. **D. scabra,** *Benth.*—Stems usually weak and decumbent, 1 to 2 ft. long. Leaves flat, flaccid. Panicle loose, varying from 2 to 8 in., the capillary branches short, scattered or in twos or threes, distant in the longer panicles, few in the short ones, not very spreading. Outer glumes 1 to 1¼ lines long, acute, keeled or the 2nd 3-nerved. Flowering glume scarcely shorter or at length rather longer, membranous, rather stiff in fruit and minutely scabrous-pubescent, the awn minute and straight, attached far above the middle and usually not exceeding the glume. Palea almost as long, rather broad. Rhachis with few hairs and produced into a bristle minute and glabrous or longer and hairy.—*Agrostis scabra,* R. Br. Prod. 172; Hook. f. Fl. Tasm. ii. 116, t. 160; *A. rudis,* Rœm. and Schult. Syst. ii. 360; *Calamagrostis rudis,* Steud. Syn. Glum. i. 192; *A. contracta,* F. Muell.; Herb. Hook. f. l. c. t. 161; *A. decipiens,* R. Br. Prod. 172; *Cinna decipiens,* Kunth, Enum. i. 207.

Queensland. Condamine River, *Hartmann.*
N. S. Wales. Port Jackson, *R. Brown;* New England, *C. Stuart.*
Victoria. Upper Hume River, Dandenong and Buffalo Ranges, Tyer's River, Sealer s Cove, *F. Mueller.*
Tasmania. Adventure Bay, *Nelson?* in Herb. R. Br.; Upper Huon River, *Gunn.*

The northern specimens have generally rather smaller spikelets than the southern ones, excepting Brown's typical ones in which they are smaller than in almost any of ours. I can perceive nothing to distinguish the *A. contracta* as a species, and Brown's *A. decipiens* appears to me to be a slight variety wth narrow leaves. *A. distans,* Kunze, raised from Australian seeds in the Leipzig Garden, is also most probably, from the very short character given in Steud. Syn. Glum. i. 176, the *D. scabra.*

13. **D. nivalis,** *Benth.*—Stems rather stout, under 1 ft. high, covered to the inflorescence by the leaf-sheaths. Leaves flat short and broad, rather stiff, crowded at the base of the stem. Panicle dense and spikelike, 1½ to 2 in. long, rather dark coloured, the short fine awns scarcely conspicuous. Outer glumes under 2 lines long, very acute, rather rigid and shining. Flowering glume rather shorter, glabrous but surrounded by the hairs of the very short rhachis or stipes, the hyaline apex obtuse and entire or scarcely notched. Awn slender, attached below the summit and projecting but little beyond it. Palea

rather broad. Rhachis produced into a short glabrous bristle.—*Agrostis nivalis*, F. Muell. in Trans. Vict. Inst. 1855, 43.

Victoria. Grassy summits of Mount Buller, *F. Mueller*.

14. **D. Gunniana,** *Benth.*—A slender tufted glabrous grass, under 6 in. high, apparently annual. Leaves very narrow, almost setaceous. Panicle loose, ovate or pyramidal, 1 to 2 in. long, with capillary clustered spreading divided branches. Spikelets about ¾ line long. Outer glumes scarcely ½ line, rather acute, with a prominent minutely ciliate or almost glabrous keel. Flowering glume twice as long, thin, 3- or 5-nerved, truncate or minutely toothed with a fine point attached very near the top and scarcely exceeding it. Palea about as long as the glume. Rhachis almost glabrous, continued into a slightly hairy bristle half as long as the glume.—*Echinopogon Gunnianus*, Nees in Hook. Lond. Journ. ii. 413.

Tasmania, *Gunn*, sent with *Agrostis scabra*, our specimens much depauperated, but the one in Herb. Lindl. described by Nees is a full-grown and very satisfactory one.

15. **D.? breviglumis,** *Benth.*—A slender grass of 1 to 1½ ft. Leaves almost filiform. Panicle rather loose, pyramidal, 1½ to 2 in. long, with capillary but short and rather rigid divided branches, the very small spikelets pedicellate. Outer glume scarcely ½ line long, very broad, obtuse or truncate. Flowering glume nearly twice as long, rather obtuse, the keel often produced into a very short point. Palea nearly as long as the glume. Rhachis glabrous, continued into a glabrous bristle nearly as long as the palea.

N. S. Wales. New England, *C. Stuart*. This species, remarkable for the short truncate outer glumes and glabrous rhachis, may not be a true congener. Munro thinks it might be referrible to the American genus *Cinna*, which however has not been yet satisfactorily worked up and defined.

SUBTRIBE III. AVENACEÆ.—Spikelets with 2, or in a few genera more than 2 perfect flowers, very rarely reduced to 1, paniculate, the rhachis of the spikelet articulate above the outer glumes, usually bearing a tuft of hairs under the flowering glumes, and (except in some *Airæ*) produced above them, frequently bearing an empty glume or imperfect flower. Awn of the flowering glume dorsal or terminal between the lobes of the glume, more or less twisted and bent. Palea as long or nearly as long as the glume, with 2 prominent nerves or keels. Grain enclosed in the glume and palea and free or adnate to the palea.

56. AIRA, Linn. (partly).

Spikelets 2-flowered, small, in a loose or rarely contracted panicle with capillary branches, the rhachis of the spikelet articulate and minutely hairy between the flowering glumes and not at all or scarcely

produced beyond them. Glumes thinly scarious, 2 outer empty ones nearly equal, acute; flowering glumes close above them, shorter, thin and hyaline, finely pointed or shortly bifid, with a fine awn dorsally attached below the middle and twisted at the base. Palea 2-nerved. Styles short, distinct. Grain enclosed in and more or less adnate to the very thin glume and palea.

A small genus, generally distributed over the temperate regions of both the northern and southern hemispheres, both the Australian species the same as northern ones, and one of them probably introduced only. The genus was formerly made to include *Deschampsia*, *Airopsis*, *Corynephorus* and others, which some botanists still retain in it, but then it is difficult to assign any limits to separate it from *Avena* on one side and from *Isachne*, *Micraira* and *Cœlachne* on the other. Other botanists distinguish generically almost every species usually retained in *Aira*.

Panicle loosely spreading, almost trichotomous . . . . 1. *A. caryophyllea.*
Panicle narrow and dense, almost spikelike . . . . . 2. *A. præcox.*

1. **A. caryophyllea**, *Linn.; Kunth, Enum.* i. 289.—A slender elegant tufted annual, rarely above 6 in. high. Leaves short and fine. Panicle loose and spreading, the capillary branches in pairs or threes. Spikelets erect, silvery-shining. Outer glumes 1 to 1½ lines long, almost scarious, very acute. Flowering glumes shorter, the dorsal awn projecting about a line beyond the outer glume.—Reichb. Ic. Fl. Germ. t. 94.

Victoria. Various localities about Melbourne, *F. Mueller* and others; Moyston, *Sullivan*; Ballarat, *Bacchus*.
Tasmania. Swanport, *Story*.

Generally distributed over the area of the genus.

*2. **A. præcox**, *Linn.; Kunth, Enum.* i. 289.—A slender annual of 2 to 4 in. or rarely attaining 6 in. Leaves few, short and fine. Panicle contracted, almost spikelike, ½ to 1 in. long. Spikelets not very numerous, erect. Outer glumes scarious, shining, acute, 1 to 1¼ lines long. Flowering glumes shorter, thin and hyaline, finely pointed but shortly bifid, the lowest sessile, the second very nearly sessile, with a few short hairs on the rhachis, which appears to be sometimes produced into a minute clavate bristle. Awn attached below the middle of the flowering glumes and shortly exceeding the outer ones.—Reichb. Ic. Fl. Germ. t. 94.

Victoria. Port Phillip, *Walter*.
W. Australia. King George's Sound, *Oldfield, F. Mueller*.

A West European and Mediterranean grass, probably introduced only into Australia.

* 57. HOLCUS, Linn.

Spikelets 2-flowered, numerous and crowded in an open panicle, the lower flower hermaphrodite, the upper one male, the rhachis glabrous and produced above the outer glumes. Outer empty glumes 2, nearly equal, complicate, keeled, awnless, enclosing the flowers. Flowering glumes shorter, the lowest awnless, the upper one with a short dorsal twisted awn.

The genus is limited to two species, spread over the temperate regions of the northern hemisphere in the Old World, of which one has now become naturalised in Australia as in South Africa.

* 1. **H. lanatus,** *Linn.; Kunth, Enum.* i. 34.—A perennial grass, with a creeping rhizome and ascending stems of 1 to 2 ft., more or less clothed as well as the leaves with a very short pubescence, which gives the whole plant a pale soft appearance. Panicle 2 to 3 in. long, pale or occasionally somewhat darker coloured. Outer glumes about 2 lines long, rather obtuse, the awn of the upper flowering glume rarely reaching their length.—Reichb. Ic. Fl. Germ. t. 105; F. Muell. Fragm. viii. 126.

Now abundantly naturalised about Moreton Bay in **Queensland,** and in various localities in **N. S. Wales, Victoria** and **Tasmania,** *F. Mueller* and many others.

* 53. ARRHENATHERUM, Beauv.

Spikelets 2-flowered, in a loose panicle, the lower flower male only, the rhachis hairy, articulate below the lowest flower and produced into a short point or bristle above the upper one. Outer empty glumes unequal, acute, keeled, thinly scarious on the sides. Flowering glumes close together, thinly scarious, 5- or 7-nerved, the lowest enclosing a male flower, with a dorsal twisted awn attached near the base, the uppermost with a fertile flower unawned. Palea prominently 2-nerved. Stigmas sessile. Grain enclosed in the glume and palea, free from them. Seed not furrowed.

The genus is limited to a single species of European origin, introduced into Australia.

*1. **A. avenaceum,** *Beauv. Agrost.* 55, *t.* 11, *f.* 5.—An erect perennial of 2 or 3 ft., not forming large tufts. Leaves few and flaccid. Panicle narrow and loose, 6 to 8 in. long, spreading when the flowers are open. Spikelets 4 to 5 lines long, the inner empty glume nearly as long as the flowering ones, the outer one shorter. Lowest male flowering glume usually 5-nerved, the awn about twice its own length. Glume of the perfect flower about 7-nerved, with sometimes a minute point near the apex, but no awn. Grain pubescent.—Kunth, Enum. i. 307; Reichb. Ic. Fl. Germ. t. 104; *Avena elatior,* Linn.

Victoria. Now established on the Upper Loddon, *F. Mueller.*

59. DESCHAMPSIA, Beauv.

Spikelets 2-flowered, in a loose or rarely contracted panicle with slender branches, the rhachis of the spikelet articulate, hairy, more or less produced between the flowering glumes and beyond the upper one as a hairy bristle or rarely bearing a terminal empty glume. Glumes keeled, with thinly scarious sides, 2 outer empty ones rather acute; flowering glumes obtuse or truncate and more or less 4-toothed, with a fine dorsal awn attached below the middle, the lowest close above the empty glumes, the upper raised on a stipes (the rhachis of the spikelet). Palea prominently 2-nerved, often 2-toothed. Styles short, distinct. Grain enclosed in the glume and palea, usually free from them.—Perennial grasses with the shining spikelets of *Trisetum* and *Aira*, usually smaller than in the former, larger than in the latter genus.

The genus is generally distributed over the temperate regions of the northern hemisphere, and is also represented without the tropics in the southern hemisphere. The only Australian species ranges generally over the generic area.

1. **D. cæspitosa,** *Beauv. Agrost.* 91, *t.* 18, *f.* 3.—A tall perennial forming large dense tufts. Leaves stiff, narrow, usually rough on the upper surface, flat or convolute when dry. Stems attaining 2 to 4 ft., although sometimes much shorter. Panicle 4 in. to near 1 ft. long, at first rather dense, spreading with capillary branches when fully out. Outer glumes 1½ to near 2 lines long, the flowering ones not exceeding them, truncate and 4-toothed, the awns very slender, scarcely or not at all twisted at the base and usually shorter than the glumes themselves. —Kunth, Enum. i. 286; Hook. f. Fl. Tasm. ii. 118; *Aira cæspitosa*, Linn.; Reichb. Ic. Fl. Germ. t. 96; Trin. Spec. Gram. t. 283.

Victoria. Avon and Omeo Rivers, and Haidinger Range, *F. Mueller.*

Tasmania. Frequent in wet places on low grounds as well as in the mountains, *J. D. Hooker* and others.

S. Australia. Between Rivoli Bay and Mount Gambier, *F. Mueller.*

Widely spread over the temperate and cool regions of the northern hemisphere, also in New Zealand and in Fuegia.

60. TRISETUM, Beauv.

Spikelets 2- rarely 3-flowered, in a narrow and dense or loose panicle, the rhachis of the spikelet articulate hairy and more or less produced between the flowering glumes and beyond the upper one as a hairy bristle or bearing a terminal empty glume or male flower. Outer empty glumes unequal, acute, keeled, thinly scarious on the sides. Flowering glumes more hyaline, keeled, acute or shortly 2-fid, with a dorsal awn attached above the middle, usually twisted at the base and bent in the middle. Palea prominently 2-nerved, usually 2-toothed. Styles distinct, stigmatic from near the base. Grain glabrous, enclosed in the glume and palea but free from them. Seed not furrowed.

The genus is generally distributed over the temperate and cooler or mountain regions of both the northern and southern hemispheres. The only Australian species is a widely spread arctic, antarctic or mountain one.

1. **T. subspicatum,** *Beauv.; Kunth, Enum.* i. 295.—A tufted perennial, varying from 6 in. to above 2 ft. high. Leaves flat, glabrous or rarely pubescent, the sheaths rather loose, the ligula large and scarious. Panicle dense almost spikelike, but much interrupted or shortly branched in the lower part, 2 to 4 in. long, silvery-shining as in *Deschampsia.* Spikelets loose and flattened, the lowest outer glume nearly 2 lines long, the 2nd rather longer, the keel minutely ciliate. Lowest flowering glume sessile above the outer ones, 2½ to near 3 lines long, the awn sometimes scarcely exceeding it sometimes twice as long; upper flowering glume smaller but inserted higher up so as to be raised to the same level and sometimes containing only a male flower, the rhachis produced beyond it into a slender bristle, rarely bearing a terminal empty glume.—Hook. f. Fl. Tasm. ii. 119.

Victoria. Munyong and other mountains of the Australian Alps, the specimens mostly glabrous, but some from Mitta-Mitta with pubescent leaves, *F. Mueller.*

Tasmania. Common in Alpine localities, *J. D. Hooker* and others; our specimens all glabrous.

* 61. AVENA, Linn.

Spikelets few-flowered, in a loose panicle, the rhachis articulate above the 2 outer glumes, hairy under the flowering glumes. Glumes scarious, at least at the top, the 2 outer empty ones lanceolate, tapering to a point; flowering glumes smaller, shortly 2-cleft at the top, with a long dorsal twisted awn, the terminal glume often small and empty or rudimentary. Styles distinct. Grain pubescent or hairy, frequently adhering to the palea. Seed deeply furrowed.

A considerable genus widely spread over the temperate and cooler regions of the world, but represented in Australia only by an introduced weed.

* 1. **A. fatua,** *Linn.; Kunth, Enum.* i. 302.—An erect glabrous annual, 2 or 3 ft. high, with a loose panicle of large spikelets, hanging from filiform unequal pedicels, arranged in alternate branches along the main axis. Outer glumes nearly ¾ in. long. Flowering glumes 2 or 3, scarcely so long, of a firm texture at the base, and covered outside with long brown hairs. Awn fully twice as long as the spikelet, twisted at the base, abruptly bent about the middle. Ovary hairy.

A common weed of cultivation in all corn countries, probably a native of the east Mediterranean region, now established as apparently wild in **S. Australia** and on the Wimmera, in **Victoria** (*F. Mueller*).

62. AMPHIBROMUS, Nees.

Spikelets several-flowered, in a loose panicle, the rhachis of the spikelet articulate hairy and slender between the flowering glumes. Outer empty glumes acute, keeled, with scarious margins, 5-nerved near the base. Flowering glumes more rigid, prominently 5-nerved, with a dorsal twisted and bent awn attached about the middle. Palea prominently 2-toothed. Styles short, distinct. Grain glabrous, enclosed in the glume and palea, and perhaps adnate. Seed deeply furrowed.

The genus is limited to the single species endemic in Australia.

1. **A. Neesii,** *Steud. Syn. Glum.* i. 328.—A glabrous erect grass of 2 or 3 ft. or even taller in marshy situations. Leaves very narrow in the smaller specimens, broader in the larger ones, with rather broad loose sheaths. Panicle 6 to 10 in. long, loose and narrow. Spikelets all pedicellate, on capillary branches, usually about ½ in. long without the awns, 5- to 10-flowered. Outer glumes varying from 2 to 4 lines long. Flowering glumes rather longer, the 5 nerves reaching to the end and when old often splitting at the apex between the nerves, rather rigid and scabrous-rugose when in fruit.—*Amphibromus*, Nees in Hook. Lond. Journ. ii. 420; *Avena nervosa*, R. Br. Prod. 178; *Danthonia nervosa*, Hook. f. Fl. Tasm. ii. 121, t. 163.

N. S. Wales. Port Jackson, *R. Brown*, *Woolls*.

Victoria. Wendu Vale, *Robertson*; Edwards River, Station Creek, *F. Mueller*; Ballarat, *Bacchus*; Moyston, *Sullivan*.

Tasmania. Port Dalrymple, *Paterson*; Formosa, *Gunn*; South Esk River and Southport, *C. Stuart*.

S. Australia. St. Vincent's Gulf, *F. Mueller*.

W. Australia. King George's Sound and neighbouring districts, *F. Mueller*, *Oldfield*, *Drummond*, n. 145, 146, 978, 979 and others.

Nees never appears to have published any specific name for this plant. In Lindley's herbarium he has named it *A. junceus*. Hooker quotes it as *A. nervosus*, Nees.

Danthonia Archeri, Hook. f. Fl. Tasm. ii. 122, t. 163, appears to me to be the same species, the specimens are in a bad state with old flowering glumes more or less split at the apex between the nerves.

63. ANISOPOGON, R. Br.

Spikelets 1-flowered, large, in a loose but scarcely branched panicle, the rhachis of the spikelet articulate above the 2 outer glumes and produced into a slender bristle above the flower occasionally bearing an imperfect spikelet. Glumes 3, the 2 outer herbaceous; flowering glume raised on a short stipes (the rhachis of the spikelet), narrow, convolute, hard, with 3 rigid awns between 2 small hyaline terminal lobes, the central awn long twisted and bent. Palea hard, ending in a long rigid 2-nerved point. Styles distinct. Ovary crowned by a tuft of hairs.

Besides the Australian species which is endemic, there is one from South Africa.

1. **A. avenaceus,** *R. Br. Prod.* 176.—An erect glabrous grass of 2 or 3 ft., branching at the base only. Leaves convolute, terminating in subulate points; ligula very short, truncate, often ciliate. Panicle long, the large spikelets hanging from slender pedicels. Outer glumes narrow, about 9-nerved, 1½ to 2 in. long. Flowering glume about ½ in. long, the central awn 2½ to 3 in. long, the lateral ones finer and not half so long. Palea longer than the entire part of the glume. Lodicules long and lanceolate. Terminal barren spikelet when present small and silky-villous.—Beauv. Agrost. t. 9, f. 8; Kunth, Rev. Gram. t. 62; Sieb. Agrostoth. n. 56.—*Deyeuxia avenacea,* Spreng. Syst. i. 254; *Danthonia anisopogon,* Trin. Spec. Gram. t. 61.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, C. Moore, Mrs. Calvert;* Clarence River, *Wilcox.*

64. DANTHONIA, DC.

Spikelets several-flowered, pedicellate or rarely almost sessile, in a panicle either loose or reduced to a single raceme, the rhachis of the spikelet articulate above the outer glumes, hairy round the flowering ones. Outer empty glumes 2, narrow, keeled, acute, unawned, usually as long as the spikelet. Flowering glumes convex at the back, usually 9-nerved, with 2 rigid or scarious terminal lobes more or less 1- or 3-nerved at least at the base, and a twisted and bent awn between them (almost reduced to a point in one species). Palea broad, as long as or usually longer than the entire part of the glume, obtuse or 2-pointed. Styles distinct. Ovary glabrous. Grain free.

The genus extends over New Zealand, South Africa and the temperate regions of the northern hemisphere, with a very few tropical species in Africa and perhaps in America. Of the eleven Australian species, one is also in New Zealand, the others apparently endemic.

Sect. I. **Micrathera.**—*Panicle very loose. Spikelets nearly glabrous. Awn of the flowering glume not exceeding the very short lateral lobes.*

Single species . . . . 1. *D. paradoxa.*

Sect. II. **Monachathera.**—*Panicle almost reduced to a raceme or very short. Flowering glumes with a broad obliquely turbinate hard base and ciliate with long hairs, the awn shorter or scarcely longer than the lobes.*

Spikelets distant, in an almost simple raceme. Lobes of the flowering glumes lanceolate, 2 or 3 times as long as the base . . . . 2. *D. bipartita*

Spikelets few, in a very short panicle. Lobes of the flowering glumes not longer than the base . . . . 3. *D. carphoides.*

SECT. III. **Eudanthonia.**—*Flowering glume ovoid or oblong at the base, scarcely oblique, ciliate at least at the base. Awn longer than the lateral lobes.*

Panicle loose. Spikelets numerous. Hairs of the flowering glume marginal and scattered or in longitudinal series on the back; lateral lobes acute or scarcely awned . . . . 4. *D. pallida.*
Panicle rather dense. Flowering glumes very small, with copious long hairs, lateral lobes very short with long awns. Leaves long and filiform . . . . . 5. *D. longifolia.*
Panicle narrow or dense. Flowering glumes oblong, with long marginal cilia but very few hairs on the back.
  Stems stout, 3 to 5 ft. high. Leaves long, with long loose sheaths. Panicle branched . . . . . . 6. *D. robusta.*
  Stems under 2 ft. high. Leaves narrow. Panicle reduced to a single raceme or the lower pedicels with 2 spikelets . . . . 7. *D. racemosa.*
  Stems under 2 ft. high. Leaves very narrow. Panicle dense . . . . 8. *D. Pilosa.*
Panicle dense or rather loose. Flowering glumes oblong, with a ring of long hairs at or below the base of the lobes.
  Outer glumes not much exceeding the spikelet. Leaves narrow but not setaceous . . . . 9. *D. semiannularis.*
  Outer glumes much longer than the spikelet. Leaves very fine in a short radical tuft . . . . 10. *D. setacea.*
Panicle small, few-flowered. Flowering glumes ciliate with long hairs, the lobes broad, not longer than the base. Small Alpine plant . . . . 11. *D. pauciflora.*

Plinthanthesis Urvillei and *P. tenuior*, Steud. Syn. Glum. i. 14, from the Blue Mountains, *Durville*, are probably amongst the plants we have, but I cannot recognise them from Steudel's character. They may be ill-described species of *Danthonia*, but the twisted awn said to be attached to the side of the upper valvula (palea) is unknown in Gramineæ, and probably a mistake.

SECTION I. MICRATHERA.—Panicle very loose. Spikelets nearly glabrous. Awn of the flowering glume very short.

1. **D. paradoxa,** *R. Br. Prod.* 177.—Stems 2 to 3 ft. high. Leaves long and narrow, glabrous. Panicle very loose, 3 to 4 in. long, with long capillary divided branches at length spreading. Spikelets pedicellate, flat, 3- or 4-flowered, 3 to 4 lines long. Outer empty glumes rather rigid, acute, 2 to 2½ lines long. Flowering glumes shorter, very shortly hairy or pubescent below the middle, the 2 lobes shorter than the base, broad, shortly nerved, unawned. Central awn not exceeding them, somewhat flattened and brown at the base as in other species, but rarely long enough to show any twist.

N. S. Wales. Port Jackson, *R. Brown.* The almost glabrous spikelets have much the appearance of those of a *Poa*, but the structure is quite that of a short-awned *Danthonia.*

SECTION II. MONACHATHERA.—Panicle a raceme or very short. Flowering glumes with a broad obliquely turbinate hard base, ciliate with long hairs, the awn shorter or scarcely longer than the lobes, which are usually rigid.

2. **D. bipartita,** *F. Muell. Fragm.* i. 160.—Stems from an almost bulbous often woolly base 1 to 2 ft. high. Leaves flat but narrow, glabrous or sprinkled with long hairs. Panicle almost reduced to a simple raceme of 3 to 6 in. Spikelets few, on short erect distant pedicels, or the lower pedicels shortly branched, with 2 or 3 spikelets. Outer glumes herbaceous, many-nerved, 5 to 8 lines long, tapering into fine points. Flowering glumes 4 to 8, scarcely exceeding the outer ones, the oblique base a little more than 1 line long and broad, with a dense ring of long hairs under the lobes. Lobes narrow-lanceolate, very acute, unawned, 3 to 4 lines long, the central awn scarcely longer. Palea obtuse or truncate.—*Monachather paradoxus,* Steud. Syn. Glum. i. 247.

N. S. Wales. Darling River and thence to Mount Murchison, *Dallachy, Woolls* and others.

W. Australia, *Drummond.* These western specimens are taller, with larger spikelets and fewer flowers than the eastern, but all appear to be referrible to one species.

3. **D. carphoides,** *F. Muell. Herb.*—Stems from 3 or 4 in. to 1 ft. high. Leaves very narrow, not long, glabrous. Panicle ovate, dense, 1 to 1½ in. long. Spikelets few, very shortly pedicellate. Outer glumes 4 to 5 lines long, rather broad, with scarious margins. Flowering glumes 3 to 6, with a broad oblique base as in *D. bipartita,* the ring of hairs almost broken into clusters; lateral lobes shorter than the base, the very fine awn scarcely exceeding them.

N. S. Wales. Macquarrie River, *C. Moore; Armidale, Perrott;* Cavan near Yass, *Mrs. Calvert.*

Victoria. Melbourne, *Adamson.*

The specimens from each locality are very few and the species requires further investigation.

SECTION III. EUDANTHONIA.—Flowering glume ovoid or oblong at the base, scarcely, oblique, ciliate with long hairs at least at the base and margins. Awn longer than the lateral lobes which are frequently scarious, except the central nerve or nerves.

F. Mueller, Fragm. viii. 135, proposes to unite the whole of the following species under the name of *D. penicillata.* They appear sometimes to run into each other in several respects, and the characters derived from the shape of the flowering glume and its lobes and hairs as well as the form of the palea may require further research before they can be definitely fixed, yet there certainly are several peculiar forms, which require to be distinguished at least as marked races.

4. **D. pallida,** *R. Br. Prod.* 177.—Stems 2 ft. high or more, often

rigid but not stout. Leaves long, terete when dry, very narrow and sometimes as slender as in *D. longifolia*, the sheaths more or less ciliate at the orifice. Panicle usually loosely branched, pale-coloured, 3 to 6 in. long. Spikelets rather numerous, the outer glumes under ½ in. long. Flowering glumes 3 or 4, not exceeding the outer ones, with long hairs on the back as well as on the margins, but scattered or in vertical lines, without the transverse ring of *D. semiannularis;* lateral lobes lanceolate, 3-nerved at the base, often scarious upwards, but the central nerve continued to the apex or produced into a point or short awn.—Trin. Spec. Gram. t. 65; Sieb. Agrostoth. n. 84, 85, 92.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *A. Cunningham*, *Woolls* and others; New England, *C. Stuart;* north of Bathurst, *A. Cunningham;* Shoalhaven, *C. Moore.*

Victoria. Barossa Range, Lower Mitta-Mitta, Forest Creek, *F. Mueller;* Riverina, *Sullivan;* Ararat, *Green.*

Tasmania. Ravenswood, *Bissill.*

W. Australia. King George's Sound, *Baxter;* Blackwood River, *Oldfield*, *Walcot.*

Var. ? *subracemosa.* Panicle narrow, very little branched. Marginal hairs of the flowering glumes copious, those on the back less so than in the typical form.—Warwick and Macleay Rivers, *Beckler.*

5. **D. longifolia,** *R. Br. Prod.* 176.—Stems densely tufted, 1 to 2 ft. high. Leaves long and filiform, often rather rigid and curved, quite glabrous without any cilia at the orifice of the sheath. Panicle dense, pale-coloured, ovate or narrow, 3 to 4 in. long. Outer glumes exceeding the spikelet, 4 to 6 lines long. Flowering glumes 3 to 5, very short, almost covered with soft hairs the upper ones very long, the 2 lobes broad and short, usually with long awns, very fine as well as the longer central one.—Sieb. Agrostoth. n. 83.

Queensland. Upper Brisbane River, *F. Mueller.*

N. S. Wales. Port Jackson, *R. Brown;* Wellington Valley, *A. Cunningham*, New England, *C. Stuart;* Macleay River, *Beckler.*

6. **D. robusta,** *F. Muell. in Trans. Vict. Inst.* 1855, 44, *Fragm.* viii. 136.—Stems from a thick horizontal rhizome stout, 3 to 5 ft. high. Leaves long, narrow, convolute when dry, glabrous, the upper one with a long loose sheath. Panicle dense, rather secund, 3 to 6 in. long. Spikelets pedicellate, about ½ in. long, 5- to 8-flowered. Outer glumes scarcely so long, the lowest rather obtuse, the 2nd tapering to a sharp point. Flowering glumes densely ciliate on the margins, with very few hairs scattered on the back, the lobes broad, tapering into short awns, the central awn long, flat and much twisted below the bend.

Victoria. Munyong Mountains up to the summit of Mount Kosciusko, Mount Buller, *F. Mueller.*

7. **D. racemosa,** *R. Br. Prod.* 177.—Stems slender, 1 to 2 ft. high. Leaves very narrow, almost setaceous, glabrous or sprinkled with spreading hairs. Spikelets in the typical form singly and very shortly pedicellate or almost sessile and rather distant along the rhachis of a simple raceme, but sometimes more approximate and the lower pedicels with 2 spikelets. Spikelets narrow, erect, under ½ in. long, the outer glumes nearly as long. Flowering glumes 6 to 8, or more in some varieties, hairy at the base and margins, glabrous or with very few hairs on the back, but the hairs variable, the marginal ones sometimes long in a dense tuft on each side of the lobes, sometimes in several distinct marginal tufts. Lateral lobes in the typical form broad with short fine points, but more awned in some varieties.

N. S. Wales. Port Jackson, *R. Brown;* Darling Downs and Armidale, *Herb. F. Mueller.*

Var. *obtusata,* F. Muell. A smaller plant. Leaves more hairy. Lateral lobes of the flowering glumes with scarcely any points.—New England, *C. Stuart.*

Var. *biaristata.* Lateral lobes of the flowering glumes broad, but with rather long points or awns.

N. S. Wales. Head of the Gwydir, *Leichhardt;* Bulli, *Johnstone.*
Victoria. Cobberas, Dandenong Ranges, Curdie's River, *F. Mueller;* Ballarat, *Bacchus.*
Tasmania. Southport, *C. Stuart.*
S. Australia. St. Vincent's Gulf, *F. Mueller.*

Var. *penicillata.* Marginal hairs of the flowering glumes in several distinct tufts on each side.—*Arundo penicillata,* Labill. Pl. Nov. Holl. i. 26, t. 34 (from the figure and description); *D. Gunniana,* Nees in Hook. Lond. Journ. ii. 416.—Tasmania, *C. Stuart, Story, Bissill, Gunn.*

Var.? *multiflora.* Spikelets often 2 together and all approximate. Flowers rather numerous in the spikelet.—Warwick, *Beckler;* Hunter's River, *Leichhardt;* New England, *C. Stuart;* interior of S. Australia, *F. Mueller.*

8. **D. pilosa,** *R. Br. Prod.* 177.—Stems rather slender, 1 to 2 ft. high. Leaves chiefly in radical tufts, very narrow but not so slender as in *D. setacea,* usually more or less hairy, the hairs sometimes long and spreading. Panicle narrow and dense, not much branched and sometimes almost as simple as in *D. racemosa.* Spikelets shortly pedicellate, about ½ in. long, the outer glumes about as long; flowering glumes 6 to 8 with lanceolate lobes tapering into fine awns almost as in *D. semiannularis,* but hairy on the margins only, without the transverse ring under the lobes of that species, and very few hairs if any on the back except at the base.—Hook. f. Fl. Tasm. ii. 120; Sieb. Agrostoth. n. 57.

N. S. Wales. Port Jackson, *R. Brown.*
Victoria. Black Forest, Deep Creek, *F. Mueller;* Swan Hill, *Gummon.*
Tasmania. Port Dalrymple, *R. Brown;* abundant throughout the island, *J. D. Hooker* and others.
W. Australia. Warren River and Kari Dale, *Walcot;* Swan River, *Drummond.*

Some forms of the species approach in habit the *D. racemosa,* but the spikelets are those of *D. semiannularis*, excepting in the want of the ring of hairs on the back under the lobes. A careful examination of numerous varieties and subvarieties of the three species may give more constant characters to distingush them, or possibly to increase or reduce their number.

9. **D. semiannularis**, *R. Br. Prod.* 177.—A variable plant, the stems usually 2 to 3 ft. high, but sometimes much lower. Leaves very narrow, flat or convolute, never so fine as in *D. setacea*, the sheaths glabrous or hairy, more or less ciliate at the orifice. Panicle sometimes loose and spreading, more frequently narrow and compact. Outer glumes acute, above ½ in. and sometimes nearly 1 in. long. Flowering glumes usually 4 to 8, not exceeding the outer ones, the lobes lanceolate, with a broad or narrow hyaline margin, acute or tapering into a point or rather short fine awn, the long hairs or cilia copious at the base and margins and forming a ring round the back immediately under the lobes, the twisted awn varying from ½ to 1 in. Palea longer than the entire base of the glume, often 2-pointed.—Hook. f. Fl. Tasm. ii. 120; Trin. Spec. Gram. t. 52; *Arundo semiannularis*, Labill. Pl. Nov. Holl. i. 26, t. 33; *D. varia*, Nees in Pl. Preiss. ii. 103; *D. setacea*, Hook. f. Fl. Tasm. ii. 121, not of R. Br.; *D. eriantha*, Lindl. in Mitch. Three Exped. ii. 307.

N. S. Wales. Port Jackson, *R. Brown*, *C. Moore*; Blue Mountains, *C. Moore*; Lachlan and Darling Rivers, *Dallachy*, *Mrs. Forde* and others.

Victoria. Neighbourhood of Melbourne, *Adamson*, *Harvey*; Grampians, *Sullivan*.

Tasmania. Port Dalrymple and Table Mountain (Mount Wellington), *R. Brown*; abundant throughout the island, *J. D. Hooker* and others.

S. Australia. St. Vincent's Gulf, *F. Mueller* and others.

W. Australia. Swan River, *Drummond*, *n.* 967, *Preiss*, *n.* 1834.

The loose-flowered form with the outer glumes dark-coloured appears to be chiefly about Port Jackson and the Blue Mountains, and occasionally in Tasmania. The common form, apparently abundant in the southern colonies, has usually a compact narrow panicle and the pale or greenish outer glumes often smooth and shining.

Var. *alpina*. Stems short and densely tufted. Leaves rather stout, convolute and very glabrous.—Summit of Mount Buller and Bogong Range at an elevation of 6000 to 7000 ft., *F. Mueller*.

Avena bipartita, Link, Hort. Berol. i. 113 (*Danthonia Linkii*, Kunth, Enum. i. 315), if as is supposed of Australian origin, is probably the *D. semiannularis*.

10. **D. setacea**, *R. Br. Prod.* 177.—Stems slender, tufted, frequently under 1 ft. high. Leaves setaceous, mostly short and erect in a radical tuft, but sometimes elongated, glabrous or sprinkled with spreading hairs. Panicle dense, usually narrow but branched, 1 to 2 in. long. Outer glumes much exceeding the flowering ones, 6 to 9 lines long. Flowering glumes rarely more than 6, very short with long very narrow lobes tapering into fine awns, the glume more or less hairy on the back, the marginal hairs and those round the base of the lobes very long. Palea usually shorter and more obtuse than in *D. semiannularis*.—Nees in Pl. Preiss. ii. 103; *D. subulata*, Hook. f. Fl. Tasm. ii. 121, t. 161; *D. cæspitosa*, Nees, l.c. 104, and perhaps of Gaudichaud.

Victoria. Apparently common in numerous localities from the Yarra to Wilson's Promontory, *F. Mueller*, *Harvey* and others.

Tasmania. Port Dalrymple, *R. Brown*; Georgetown and Launceston, *Gunn*; Richmond, *Oldfield.*

S. Australia. Near Adelaide, *F. Mueller.*

W. Australia. King George's Sound, *R. Brown*, *F. Mueller* and others, and thence to Swan River, *Oldfield*, *Drummond*, *n.* 968, *Preiss*, *n.* 1834, 1859.

D. pilosa, Trin. Spec. Gram. t. 51 appears to me to represent rather *D. setacea* than the true *D. pilosa*. *D. cæspitosa*, Gaudich. in Duperr. Voy. Bot. 408, from Sharks' Bay, judging from the fig. and descr. in Kunth, Rev. Gram. t. 177, must come very near the weaker longer leaved forms of *D. setacea*, but with a short loose panicle and smaller spikelets. Trinius thinks it a form of *D. semiannularis*, in which he may be right.

11. **D. pauciflora,** *R. Br. Prod.* 177.—A small plant forming low dense branching tufts of fine rigid leaves not above 1 in. long and the stems not above 6 in. or when luxuriant both weaker and longer: Panicle ovoid, of few shortly pedicellate spikelets, sometimes reduced to 2 or 3. Outer glumes 3 lines long or rather more. Flowering glumes 3 or 4, very short, with short broad lobes acute or with short fine awns, the hairs chiefly at the base and margins not forming a transverse ring, the central awn rather longer than the lobes or lateral awns. Palea obtuse.—Hook. f. Fl. Tasm. ii. 121, t. 162.

Tasmania. Table Mountain (Mount Wellington), *R. Brown*; Western and other mountains, *Gunn*, *Archer*; summit of Mount Lapeyrouse, *Oldfield*; of Mount Field East, *F. Mueller.*

Var.? *elongata.* Stem and leaves much longer than in the typical form.—Southport, *C. Stuart.*

Var.? *alpina*, F. Muell. Panicle small and narrow. Glumes small, the flowering ones with very few hairs and very short awns, but with the short broad lateral lobes of the typical form.

Victoria. Summits of the Australian Alps, *F. Mueller.*

TRIBE VI. ASTREPTÆ.—Spikelets with several or in a few genera only 1 or 2 hermaphrodite flowers, the rhachis articulate above the 2 empty usually persistent outer glumes or inarticulate, usually produced and often bearing 1 or more empty glumes above the flowers. Flowering glumes unawned or with 1 or more terminal untwisted awns. Palea not much shorter than the flowering glume, with 2 prominent nerves or keels. Stamens never more than 3. Styles usually short, with plumose stigmas.

SUBTRIBE I. PAPPOPHOREÆ.—Spikelets 1- or several-flowered in a dense compound head or in a spike or loose panicle. Flowering glumes rounded on the back, with 3 or more nerves, leading to 3 or more terminal lobes or teeth, all unawned or the central one or all tapering into untwisted awns.

65. AMPHIPOGON, R. Br.

(*Ægopogon*, *Beauv.* Gamelythrum, *Nees.*)

Spikelets 1-flowered, nearly sessile in a dense panicle contracted into a head or short spike, the rhachis of the spikelet articulate above the 2 outer glumes, and not continued beyond the flower. Glumes 3, 2 outer persistent, membranous, 3-nerved, acute or tapering to an awn-like point, rarely 3-fid.; flowering glume raised on a short hairy stipes (the rhachis of the spikelet), closed round the flower, deeply divided into 3 narrow lobes tapering into straight points or awns. Palea usually as long as the flowering glume, deeply divided into 2 narrow rigid lobes or awns. Styles united at the base, free upwards. Grain enclosed in the slightly hardened upper glume.—Perennial grasses with convolute terete or subulate leaves.

The genus is endemic in Australia.

Spikelike panicle oblong. Outer glumes glabrous, 3-lobed. Stems slender, under 6 in. . . . . 1. *A. debilis.*
Spikelike panicle cylindrical or oblong, rarely shortened into an ovoid head. Outer glumes entire, rather acute 2. *A. strictus.*
Head dense, ovoid-globular.
  Outer glumes hairy, with rigid points. Flowering glume nearly sessile, the awns not protruding beyond the outer glumes. Stems usually pubescent . . . . 3. *A. laguroides.*
  Outer glumes ciliate, with fine points. Flowering glume nearly sessile, the capillary awns protruding beyond the outer glumes. Stems glabrous . . . . . . 4. *A. cygnorum.*
  Outer glumes ciliate, with long points. Flowering glume on a long stipes, the fine awns protruding . . . . 5. *A. turbinatus.*

1. **A. debilis,** *R. Br. Prod.* 175.—A small decumbent or tufted grass, rarely above 6 in. high, the stems and leaves almost filiform. Spikelike panicle oblong, ½ to ¾ in. long. Spikelets very narrow, 2½ to 3 lines long. Outer glumes 3-nerved, divided to near the middle into 3 acute lobes, the central one rather rigid, the lateral ones rather shorter and thinner or almost hyaline. Flowering glume glabrous, surrounded by a tuft of hairs on the rhachis or stipes, deeply divided into 3 awn-like lobes, glabrous or minutely ciliate, the lateral ones with narrow hyaline margins. Palea deeply 2-lobed.—*Ægopogon debilis,* Beauv. Agrost. 122.

W. Australia. King George's Sound, *R. Brown*, *Baxter*, also *Drummond*, *n.* 117.

F. Mueller, Fragm. viii. 201, unites this with *A. strictus* under the name of *A. Brownei*, but besides the habit and other characters, although the outer glumes of *A. strictus* may when old split up irregularly, they are never trifid when young as in *A. debilis.*

2. **A. strictus,** *R. Br. Prod.* 175.—Stems from a horizontal rhizome or tufted branching base erect and slender, usually above 1 ft. high. Leaves rather short, erect, subulate, glabrous. Spikelike panicle dense,

oblong or cylindrical, ½ to 1½ in. long, but little branched. Outer glumes broad, concave, faintly 3-nerved, almost scarious, entire when perfect, the outer one about 2 lines, the inner rather longer and more acute. Flowering glume on the short hairy stipes shorter than the outer glume, with 2 short rows of hairs on the back, divided into 3 rigid ciliate linear lobes or awns longer than the entire part. Palea narrow, deeply divided into 2 rigid lobes similar to those of the flowering glume. Seed separable from the membranous pericarp.—*Ægopogon strictus*, Beauv. Agrost. 122; *Amphipogon caricinus*, F. Muell. in Linnæa, xxv. 445; *A. Brownei*, F. Muell. Fragm. viii. 201, partly.

N. S. Wales. Port Jackson, *R. Brown*, *Woolls* and others; Croker's Range, *A. Cunningham*; Darling River, *Mrs. Forde*; Nandarooga Creek, *Victorian Expedition*.
Victoria. Glenelg River, *Robertson*; Grampians, *F. Mueller*.
S. Australia. Around St. Vincent's Gulf, *F. Mueller* and others; in the interior, *Babbage*, *Giles*.
W. Australia. Swan River, *Drummond* 1*st coll.*, *also n.* 982 *and* 987.

Brown's typical specimens have short erect leaves and the cylindrical spike scarcely above ½ in. long, and a few of the Port Jackson specimens are quite like them, but most of the others pass into some of the following varieties:

Var. *gracilis*. Spike narrow with small spikelets, the awns scarcely ciliate.—*A. gracilis*, Nees in Pl. Preiss. ii. 101.—Callitris Plains, *Leichhardt*; York district, W. Australia, *Preiss*, *n.* 1831.

Var. *setifer*. Spike ovate or ovate-oblong, or cylindrical when young, ½ to ¾ in. long. Spikelets at length larger than in the typical form, the outer glumes ciliate with rigid hairs on the margin and back.—Lofty Range, *F. Mueller*. Drummond's above-quoted W. Australian specimens connect this and the following variety.

Var. *avenaceus*. Leaves long. Spike 1 to 1½ in. long, with rather large spikelets. —*A. avenaceus*, R. Br. Prod. 175.—King George's Sound, *R. Brown*, and a few specimens from other localities above quoted.

Kunth, Enum. i. part ii. 196 describes the styles as distinct. In all the specimens I have examined I have found them united to about halfway up to the stigmas.

3. **A. laguroides**, *R. Br. Prod.* 175.—Stems rigid, rather slender, 1 to 2 ft. high, softly hairy or pubescent between the nodes or rarely glabrous. Leaves terete, rigid, glabrous. Spikelike panicle or head dense, ovoid-globular, about ½ in. long, usually dark-coloured. Spikelets sessile, a few of the lower ones narrow and barren. Outer glumes nearly equal, 3 to 4 lines long, membranous, lanceolate, hispid with long hairs slightly dilated at the base, tapering into fine rigid points. Flowering glume paler and thinner, shorter, slightly hairy, divided to near the middle into lanceolate lobes tapering into rigid points or awns not protruding beyond the outer glumes. Palea as long and nearly as broad, 2-lobed, with hyaline margins almost produced into additional lateral lobes. Styles very shortly united at the base.—*Ægopogon laguroides*, Beauv. Agrost. 122.

W. Australia. King George's Sound, *R. Brown*; also *Drummond*, 1*st coll.*

Pentacraspedon amphipogonoides, Steud. Syn. Glum. i. 151, from King George's Sound, *Durville*, is probably this species, distinguished chiefly by the awns being reduced to short points.

4. **A. cygnorum,** *Nees in Pl. Preiss.* ii. 100.—Rather more slender than *A. laguroides* and quite glabrous. Leaves short. Spikelike panicle or head ovoid-globular, about ½ in. long, pale-coloured, the fine points or awns of the glumes very prominent. Outer glumes thinly membranous, ciliate, 2 to 3 lines long, produced into rigid points or awns, that of the lowest one longer than the glume itself. Flowering glume silky-hairy, the three lobes produced into slender awn-like capillary points 2 to 3 lines long, and twice or 3 times as long as the entire base. —*A. laguroides*, F. Muell. Fragm. viii. 201, not of R. Br.

W. Australia. King George's Sound to Vasse and Swan Rivers, *Preiss, n.* 1851, *Drummond, n.* 218, 373, 392, 398, *Mrs. Molloy, Oldfield* and others.

5. **A. turbinatus,** *R. Br. Prod.* 175.—Stems 1½ to 2 ft. high, perfectly glabrous, often more leafy than in *A. laguroides*, the upper sheaths often dark-coloured and conspicuous. Spikelike panicle or head when full grown much larger than in *A. laguroides*, the spikelets dark-coloured and 4 to 5 lines long without the awns; in several specimens, however, the heads are smaller with short awns but with the spikelets apparently all barren. Outer glumes sprinkled and fringed with long hairs, tapering into rather long points. Flowering glume on a long stipes, pale-coloured, with narrow rigid lobes tapering into fine awns of 3 to 5 lines, bordered at the base by narrow hyaline margins. Styles shortly united.—F. Muell. Fragm. viii. 201; *Ægopogon turbinatus*, Beauv. Agrost. 122; *Gamelythrum turbinatum*, Nees in Pl. Preiss. ii. 101.

W. Australia. King George's Sound and neighbouring districts, *R. Brown, Drummond, n.* 298, 374, 378, *Preiss, n.* 1849, 1850, *Oldfield, Maxwell, F. Mueller.*

Gamelythrum denudatum, Nees in Pl. Preiss. ii. 101, described from specimens with abortive spikelets only, cannot be identified by the character given.

66. ECHINOPOGON, Beauv.

Spikelets 1-flowered, nearly sessile in a dense panicle contracted into a head or short spike, the rhachis of the spikelet articulate above the 2 outer glumes and produced into a short bristle above the flower. Glumes 3, 2 outer persistent, acute, keeled; flowering glume thin, 5-nerved, 3-lobed, the lateral lobes unawned, the central one produced into a fine straight awn. Palea narrow. Styles distinct, the stigmas very shortly plumose. Grain enclosed in the flowering glume but free from it.

The genus is limited to the single Australian species, which extends only into New Zealand.

1. **E. ovatus,** *Beauv. Agrost.* 42, *t.* 9, f. 5.—An erect glabrous grass, from under 1 ft. to above 2 ft. high. Leaves flat, very scabrous, the asperities reversed on the sheath and back of the blade, erect on

the upper surface. Head or spikelike panicle on a long terminal peduncle, varying from ovoid-globular and ½ in. diameter to oblong-cylindrical and 2 in. long. Spikelets numerous and densely crowded, about 1½ lines long without the awns. Outer glumes lanceolate, boat-shaped, the keel prominent green and ciliate. Flowering glume rather broad, surrounded by a tuft of hairs, the lateral lobes very short, acute, rigid at the base, the central one shortly flat at the base, tapering to an awn of 2 to 4 lines. Palea nearly as long as the glume. Bristle continuing the axis at the back of the palea usually shorter than the glume, bearing a short tuft of hairs or rudimentary glume.—Hook. f. Fl. Tasm. ii. 117; Sieb. Agrost. n. 89; *Agrostis ovata*, Forst.; Labill. Pl. Nov. Holl. i. 19, t. 21; R. Br. Prod. 171; *Cinna ovata*, Kunth, Enum. i. 208; F. Muell. Fragm. viii. 106; *Echinopogon Sieberi*, Steud. Syn. Glum. i. 183 (from the reference to Sieber).

Queensland. Brisbane River, Moreton Bay, *Bailey*; head of the Gwydir River; *Leichhardt.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls*, *C. Moore* and others; northward to New England, *C. Stuart*; Clarence, Macleay and Hastings Rivers, *Beckler* and others; southward to Illawara, *Johnstone.*

Victoria. Yarra River, *F. Mueller* and others; Ballarat, *Bacchus*; Red Jacket Creek, *Gargurevich.*

Tasmania, *Labillardière*; abundant throughout the island, *J. D. Hooker.*

S. Australia. Lofty Range, *F. Mueller.*

W. Australia. *Drummond*, *n.* 348; Warren River, *Walcot.*

In some specimens several of the spikelets, especially in the lower part of the head, appear to contain only a male flower or to be reduced to the 2 empty glumes, the interior of the spikelet may, however, in many cases have already fallen away.

67. PAPPOPHORUM, Schreb.

Spikelets with one hermaphrodite flower and 1 or more male or rudimentary flowers or empty glumes above it, in a short dense and spikelike or narrow and loose panicle, the rhachis of the spikelet articulate above the outer glumes and hairy round the flowering glume. Outer glumes membranous, many-nerved, awnless, as long as the spikelet. Flowering glume broad, membranous, with 9 or in species not Australian more nerves produced into more or less plumose awns. Palea 2-nerved, as long as the glume or longer. Styles distinct. Grain enclosed in the glume and palea, free from them.

Besides the Australian species, which are almost endemic, one of them extending to New Guinea, there are a few African ones of the same section, and several from America, with more numerous awns to the flowering glume.

Outer glumes 1 to 2 lines long, 5- to 9-nerved . . . . . 1. *P. nigricans.*
Outer glumes 3 lines long 11- to 21-nerved . . . . . . 2. *P. avenaceum.*

1. **P. nigricans,** *R. Br. Prod.* 185.—Stems from under 1 ft. to 1½ ft. high. Leaves flat or convolute, usually narrow, sometimes quite setaceous, glabrous pubescent or villous, the nodes glabrous or bearded. Panicle dense and spikelike, varying from ovoid-oblong and under ½ in.

long, to narrow cylindrical and 3 in. long, or broader more branched and 2 to 3 in. long, but always dense, pale or dark coloured. Outer glumes varying from 1 to rather above 2 lines long, obtuse or acute, striate with usually 7 or 9 nerves, but sometimes especially on the lowest glume reduced to 5 and 2 of those short. Flowering glume not above 1 line long, more or less hairy outside especially at the base, with 9 fine spreading plumose awns varying from the length of the glume to twice as long. Above the flowering glume and enclosed in it is usually a similar smaller one with a male or rudimentary flower, and 1 or 2 still smaller empty ones.—*P. pallidum*, R. Br. l. c., Kunth, Rev. Gram. t. 51; *P. purpurascens* and *P. gracile*, R. Br. l. c., *P. cærulescens*, Gaudich. in Freyc. Voy. Bot. 409; *P. flavescens*, Lindl. in Mitch. Trop. Austr. 34; *P. virens*. Lindl. l. c. 360; *P. commune*, F. Muell. Fragm. viii. 200.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown; Henne;* Victoria River, *Elsey, F. Mueller;* Nichol Bay. and Dampier's Archipelago, *Walcot.*

Queensland. Broad Sound and Keppel Bay, *R. Brown;* Port Curtis, *M'Gillivray;* King's Creek, *Bowman;* Peak Downs, *Burkitt.*

N. S. Wales. Port Jackson, *R. Brown* and others. In the interior to the Darling and Murumbidgee, *A. Cunningham, Mitchell* and others; Liverpool plains and New England, *C. Stuart.*

Victoria. Portland, *Allitt;* to Snowy River, *F. Mueller.*

S. Australia. Spencer's Gulf, *R. Brown;* St. Vincent's Gulf to the Murray, *F. Mueller* and others; in the interior Lake Eyre, *Andrews;* Charlotte Waters, *Giles.*

W. Australia, King George's Sound and neighbouring districts, *A Cunningham, Drummond, n.* 966, *Dempster.*

Also in New Guinea, *M'Gillivray.*

Evidently a very common plant and most variable in aspect, and it seems at first most difficult to unite the small slender *P. gracile*, Br., with a looser pale spike and rather narrow spikelets, with the stouter larger typical dark-coloured plant with dense cylindrical spikes, but, on going through the long series of specimens before me in different stages of development, I failed in sorting them into distinct varieties, and felt obliged to follow F. Mueller in regarding them all as one species, with the exception of the following about which I feel some doubts.

2. **P. avenaceum,** *Lindl. in Mitch. Trop. Austr.* 320.—Very near the *P. nigricans* with which F. Mueller unites it under the name of *P. commune*, and with the same habit but the spikelike panicle looser with fewer and larger spikelets. Outer glumes fully 3 lines long, with numerous nerves, usually more than 11 and sometimes as many as 21. Flowering glumes several, closely imbricate, the outer ones with a fertile flower enclosing 1 or 2 with male (or sometimes a second fertile) flowers and 1 or 2 small empty glumes.

N. S. Wales. Victoria (Barcoo) River, *Mitchell;* Murray and Darling Rivers, *Dallachy, Mrs. Calvert* and others.

Central Australia. Lake Eyre, *Andrews;* between Alice Springs and Charlotte Waters, *Giles.*

68. ASTREBLA, F. Muell.

Spikelets few-flowered, sessile or nearly so in the alternate notches of the continuous rhachis of one or two simple secund spikes, the rhachis of the spikelet articulate above the 2 outer glumes. Outer empty glumes 2, glabrous, acute, many-nerved, unawned. Flowering glumes silky-hairy, 3-lobed, the central lobe with a broad base tapering into a straight or curved not twisted awn, the lateral lobes erect, rigid, 2- or 3-nerved. Palea with 2 prominent ciliate nerves or keels. Styles distinct, very short. In both species the spikes are usually single, very rarely 2 together at the end of the peduncle.

The genus is limited to Australia. It is certainly nearly allied to *Danthonia*, but the terminal untwisted awn or central lobe of the glumes places it amongst Pappophoreæ, whilst the inflorescence is rather that of Chlorideæ.

Spikelets closely imbricate on one side of a secund spike of 2 to 3 in. Awn about as long as the lateral lobes . .	1. *A. pectinata.*
Spikelets at some distance, almost erect in a secund spike of 3 to 6 in. Awn much longer than the lateral lobes, straight or hooked	2. *A. triticoides.*

1. **A. pectinata,** *F. Muell. Herb.*—An erect glaucous grass of 1 to 2 ft., glabrous except sometimes a few hairs at the orifice of the sheaths. Leaves flat, ending in long points, smooth or scarcely scabrous. Spikelets sessile in the alternate notches of a secund spike of 2 to 3 in., closely imbricate and turned to one side. Outer glumes 4 to 5 lines long, glabrous, acute, 9- or 11-nerved, with scarious margins. Flowering glumes 3 or 4, the entire part scarcely 1 line long, densely villous outside as well as the broad base of the middle lobe; lateral lobes semilanceolate, glabrous, rigid, 4 to 5 lines long, acute, 2- or 3-nerved, with the outer margin broadly scarious; central lobe broad, ovate, concave, keeled, tapering into a slender straight awn about as long as or rather longer than the lateral lobes. Rhachis of the spikelet articulate only above the outer glumes, very hairy between the flowering ones, continued and less hairy above the perfect flowers with one or two glabrous glumes and paleæ empty or with rudimentary flowers.—*Danthonia pectinata,* Lindl. in Mitch. Three Exped. ii. 26.

N. Australia. Sturt's Creek, *F. Mueller.*
Queensland. Warrego and Curriewillighee, *Dalton.*
N. S. Wales. Darling River to the Barrier Range, *Victorian Expedition.*
Central Australia. Lake Eyre, *Andrews.*

2. **A. triticoides,** *F. Muell. Herb.*—Very near *A. pectinata,* apparently a taller plant, the leaves more or less scabrous or ciliate on the edges. Spikes 3 to 6 in. long. Spikelets alternate, not closely imbricate and often almost erect and at some distance from each other. Outer empty glumes usually very unequal, the lowest short, the 2nd 4 or 5 lines long, Flowering glumes shorter, the lateral lobes shorter and more rigid than in *A. pectinata* and the awn much exceeding them,

the dorsal hairs appressed and silky.—*Danthonia triticoides*, Lindl. in Mitch. Trop. Austr. 365.

N. Australia. Sturt's Creek, *F. Mueller.*

Queensland. Dawson River, *F. Mueller;* Curriwillighee, *Looker;* Warrego, *Barton;* Flinders River, *Sutherland;* Durr River, *Dallachy.*

N. S. Wales. Between the Darling and Cooper's Creek, *Neilson.*

Central Australia. Charlotte Waters, *Giles.*

Var. *lappacea.* Spikelets usually thicker, the largest outer glume often ½ in. long. Awns of the flowering glumes usually longer than in the typical form, often bent about and some or nearly all with a rigid hook at the end but exceedingly variable; in some specimens the hook is very rare and the length of the awns very irregular.—*Danthonia lappacea*, Lindl. in Mitch. Three Exped. i. 313.—In many of the same localities as the typical form, as Sturt's and Attack Creeks, Suttor River, Warrego, Barcoo, Mitchell Downs, between the Darling and Cooper's Creek, Lake Eyre, but very few specimens seen from each locality, and often at first sight unlike each other.

69. TRIRAPHIS, R. Br.

Spikelets several-flowered, in a terminal panicle, the rhachis of the spikelet articulate above each glume, the terminal glume usually empty or with a male flower. Outer empty glumes unawned, entire or the 2nd occasionally notched with a short point in the notch. Flowering glumes with 3 narrow lobes tapering into straight awns, the central occasionally with a short lobe or point on each side, or all 3 reduced to small teeth. Palea narrow. Styles distinct. Grain enclosed in the thin or coriaceous glume and palea, free from them.

The genus is limited to Australia.

Panicle soft and dense. Flowering glumes hairy, with a pointed lobe or short awn on each side of the central awn.	1. *T. mollis.*
Panicle loose. Flowering glumes coriaceous, with 3 entire awned lobes.	
Stems and leaves glabrous. Outer glumes under 2 lines long. Flowering glumes shortly silky-pubescent .	2. *T. pungens.*
Stem and leaves glabrous. Outer glumes 5 to 6 lines long. Flowering glumes fringed on the keel with a double row of short hairs	3. *T. bromoides.*
Stem and lower leaf-sheaths woolly. Spikelet of *T. bromoides*	4. *T. danthonioides.*
Panicle very loose. Flowering glumes coriaceous, with 3 small teeth or points	5. *T. microdon.*

1. **T. mollis,** *R. Br. Prod.* 185.—A glabrous rather slender erect grass attaining 2 ft. but sometimes much smaller. Leaves long and narrow, ending in fine points. Panicle narrow, dense, 6 to 10 in. long, with a soft look owing to the slender awns and hairs of the glumes. Spikelets crowded on the short erect branches, narrow, about ½ in. long without the awns, with 8 to 10 or even more flowers. Glumes narrow, membranous, about 1½ lines long, the 2 outer empty ones glabrous, entire or the 2nd with a short tooth on each side of the point. Flowering glumes sprinkled with a few long hairs, the central capillary

awn 3 to 4 lines long, with a pointed lobe or snort awn on each side, the lateral awns rather shorter.—F. Muell. Fragm. viii. 108.

N. Australia. Arnhem's Land, *F. Mueller;* Dampier's Archipelago, *Walcot.*

Queensland. Thirsty Sound, *R. Brown;* Port Curtis, *M'Gillivray;* Rockhampton and neighbouring districts, *O'Shanesy* and others.

N. S. Wales. Narran River, *Mitchell;* Darling River to Cooper's Creek, *Victorian and other Expeditions.*

Victoria. Wimmera, *Wilson.*

Central Australia. Alice Springs and M'Donnell Range, *Giles.*

W. Australia, *Drummond,* a single panicle in Herb. F. Muell.

Var. *humilis*, 6 to 8 in. high, with flattened leaves and a panicle of 2 to 3 in.—Lake Eyre, *Andrews;* north of Fowler's Bay, *Giles.*

2. **T. pungens,** *R. Br. Prod.* 185.—A glabrous slender grass of about 2 ft., branching at the base. Leaves chiefly in the lower part, very narrow and convolute, often subulate and rigid. Panicle loose but narrow, 3 to 4 in. long. Spikelets 4 to 5 lines long without the awns. Outer empty glumes glabrous, narrow, coriaceous, 3 lines long or rather more, entire. Flowering glumes shorter below the division, coriaceous, shortly silky-pubescent, the 3 awns nearly equal, all entire and slightly dilated and rigid at the base.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* Victoria River and Sea Range, *F. Mueller;* Port Darwin, *Schultz.*

T. diantha, F. Muell. Fragm. viii. 125, from Escape Cliffs, *Hulse*, is founded on a single starved specimen, which appears to me to be a state of *T. pungens* with the spikelets reduced to 1 or 2 flowers.

3. **T. bromoides,** *F. Muell. Fragm.* viii. 108.—A taller and stouter grass than *T. pungens*, quite glabrous. Leaves terete, erect, rigid, pungent-pointed, with rather broad sheaths. Panicle very loose but narrow, above 1 ft. long, with erect capillary branches and pedicels. Glumes narrow, coriaceous, the outer empty ones nearly ½ in. long, the lowest entire, acute or shortly pointed, the 2nd with a finer point and a small lobe on each side. Flowering glumes shorter below the division, the midrib fringed with a double row of short fine spreading hairs, the awns 3 to 6 lines long, rigid and dilated at the base, capillary at the end.

W. Australia, *Drummond, n.* 128; Murchison River and Geograph Bay, *Oldfield.*

4. **T. danthonioides,** *F. Muell. Fragm.* viii. 125.—Taller and stouter even than *T. bromoides*, often 3 to 4 ft. high. Leaves as in that species rigid and terete, but the lower part of the stem and the lower leaf-sheaths covered with a long loose wool. Panicle very loose, often above 1 ft. long. Spikelets in some specimens as long as in *T. bromoides*, in others smaller. Outer glumes varying from 4 to 7 lines. Flowering glumes always with the double row of hairs on the midrib as in *T. bromoides.*

W. Australia, *Drummond, n.* 74, 207, 345.

5. **T. ? microdon,** *Benth.*—An erect glabrous grass of 2 or 3 ft. Leaves narrow, flat or convolute. Panicle very loose, with long capillary branches, bearing each 1 to 3 large flat spikelets, on capillary pedicels, at first erect, at length pendulous. Spikelets 10- to 14-flowered, ¾ to 1 in. long, the rhachis with a tuft of short hairs under each flowering glume. Outer empty glumes narrow, acute, keeled, with or without a faint nerve on each side. Flowering glumes distant from each other, about 4 lines long, rigid with 5 very prominent nerves, of which the 3 principal ones produced into short terminal points or teeth, the central one rather the longest.

N. S. Wales. Blue Mountains, *C. Moore.* Munro thinks that this grass is incorrectly referred to *Triraphis*, but I can suggest no nearer affinity.

70. TRIODIA, R. Br.

Spikelets several-flowered, paniculate, the rhachis articulate above the outer glumes and between the flowering ones, hairy round them or glabrous. Glumes unawned, 2 outer empty ones acute, keeled, glabrous or the keel scabrous-ciliate. Flowering glumes usually shorter, unawned, the lower part rounded on the back, more or less 3-nerved at first, often hardened and nerveless in fruit, with 3 terminal 1- or 3-nerved lobes or teeth. Palea about as long as the entire part of the glume, with 2 prominent nerves. Ovary glabrous. Styles very short, distinct. Grain somewhat dorsally compressed, enclosed in the glume and palea, free from them.

The Australian species are all endemic, and include the troublesome prickly desert grasses, sent by early collectors with the name of "Porcupine Grass," but now more generally and disagreeably known to explorers by that of "Spinifex," totally disconnected however with the botanical genus *Spinifex*. Besides the Australian species, a common European grass and a few African ones have been referred to the genus *Triodia*.

Leaves very pungent, the sheaths usually viscid. Flowering glumes silky-ciliate, divided nearly to the middle into 3 lobes.
Panicle loose and spreading. Spikelets dark, ½ in. long, 8- to 12-flowered . . . . 1. *T. Mitchelli.*
Panicle narrow and dense. Spikelets pale coloured, 3 to 4 lines long, about 6-flowered . . . . . . 2. *T. pungens.*
Panicle long narrow and dense. Spikelets pale coloured, very numerous, under 3 lines long, about 3-flowered 3. *T. Cunninghamii.*
Leaves very pungent, the sheaths not viscid. Flowering glumes silky-villous at the base, with 3 sets of 3 nerves each, leading to 3 small obtuse teeth . . . . . . 4. *T. irritans.*
Leaves not pungent. Flowering glumes glabrous or nearly so, with 3 short 1-nerved acute teeth. Panicle very long.
Spikelets 3 to 3½ lines long, about 4-flowered. Flowering glume almost nerveless below the teeth 5. *T. procera.*
Spikelets 1½ to 2½ lines long, 3- or 4-flowered. Nerves of the flowering glume continued below the teeth or to the base . . . . 6. *T. microstachya.*

1. **T. Mitchelli,** *Benth.*—Leaves very nearly those of *T. pungens* but longer, nearly terete, pungent-pointed, with viscid sheaths. Panicle very much looser, 3 to 4 in. long, with capillary branches more or less spreading, the lower ones 1 to 1½ in. long with 3 or 4 pedicellate spikelets, the upper ones short with 1 or 2 spikelets. Spikelets dark-coloured, ½ in. long when fully out, ovate or oblong, with 8 to 12 flowers. Outer glumes 3-nerved, obtuse or minutely 3-toothed, about 3 lines long. Flowering glumes 2½ lines long, 3-nerved, the entire part densely silky-villous and at length somewhat hardened, the 3 acute rigid glabrous lobes as long as the entire part or the central one rather longer. Palea glabrous.—*T. pungens,* Lindl. in Mitch. Trop. Austr. 340, not of R. Br.

Queensland. On the Maranoa, *Leichhardt;* near Mount Pluto, *Mitchell.*

2. **T. pungens,** *R. Br. Prod.* 182.—A rigid scrubby more or less glutinous grass, creeping or decumbent and branching at the base, the flowering stem 1 to 2 ft. high. Leaves narrow, convolute, rigid, very acute or pungent-pointed, usually in the specimens seen 3 to 6 in. long. Panicle 3 to 6 in. long, narrow and almost spikelike, the lower erect branches rarely 1 in. long. Spikelets 3 to 4 lines long, pale-coloured, with about 6 flowers. Outer glumes glabrous, acute, under 3 lines long. Flowering glumes rather shorter, the entire base broad, with long silky hairs at the base and margins, but few on the back, hardened and almost nerveless in fruit, the 3 lobes broad, glabrous, rigid, acute, nearly as long as the entire part, and each one more or less distinctly 3-nerved in the centre. Palea as long, the 2 nerves or keels very prominent or narrowly winged.—*Festuca viscida,* F. Muell. Veg. Chath. Isl. 59, Fragm. viii. 129.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown, Henne;* North-west coast, *A. Cunningham.*

N. S. Wales ? All over the N. W. interior, *A. Cunningham,* but no specimens of his with any precise station.

Central Australia, *Gosse,* with shorter very acute lobes to the flowering glume.

This and the preceding and following species certainly appear to be very distinct, although the form of the flowering glume is about the same in all three. But abundant as these *Triodia* are, they are said to be but rarely found in flower, and the specimens we have are too few to judge fairly of their specific relations.

3. **T. Cunninghamii,** *Benth.*—Leaves 2 ft. high or more. Leaves convolute and rigid with the sheaths more or less viscid as in *T. pungens,* but much longer, and in one specimen the lower sheaths are ciliate with long silky hairs. Panicle narrow, dense, from a few inches to 1 ft. long. Spikelets under 3 lines long, very numerous, nearly sessile on the erect branches, mostly about 3-flowered. Flowering glumes scarcely exceeding the outer ones, hairy at the base, divided to near the middle into 3 acute lobes as in *T. pungens,* but very much smaller.

N. Australia. Cambridge Gulf, N. W. coast, *A. Cunningham.*

Queensland. Suttor Desert, *F. Mueller,* apparently the same as Cunningham's plant, but only a single specimen seen.

4. **T. irritans,** *R. Br. Prod.* 182.—A rigid scrubby glabrous grass, with long rigid convolute pungent-pointed leaves, not viscid in any of the specimens seen. Panicle narrow, almost spikelike, 3 to 6 in. long. Spikelets solitary or few together on short erect capillary pedicels or branches, mostly 3- or 4-flowered, 4 to 5 lines long. Outer glumes glabrous, acute, 5-nerved, 3 lines long. Flowering glumes not quite so long, villous with silky hairs at the base but much less so than in *T. pungens,* truncate at the end, with 3 sets of 3 nerves each leading to three very short obtuse or truncate lobes or teeth, the lateral ones rather broad, the central one smaller or minute. Palea narrow.—*Festuca irritans,* F. Muell. Veg. Chath. Isl. 59, Fragm. viii. 129.

N. S. Wales. Murray and Darling Deserts, *Victorian and other Expeditions.*

Victoria. North-west Deserts, *Lockhart Morton* and others.

S. Australia. South Coast, *R. Brown;* Gawler River, *Behr;* Flinders Range and Mount Remarkable, *F. Mueller,* and probably the "Porcupine Grasses" of the southern interior deserts of Australia belong generally to this species.

5. **T. procera,** *R. Br. Prod.* 182.—Stems many feet high. Leaves long, pungent-pointed, the sheaths slightly viscid at the orifice in Mueller's specimens, less so in Brown's, with long loose sheaths, but the structure of the spikelets the same in all. Panicle rather loose but very long and narrow, attaining 1½ ft. in Brown's specimens. Spikelets 3- or 4-flowered, pale-coloured, very numerous and shortly pedicellate along the long erect branches, oblong, 2 to 3 lines long, and scarcely flattened in most specimens, but rather longer and broader when fully out. Outer glumes rather broad, acute, several-nerved, glabrous or the midrib minutely scabrous-ciliate. Flowering glumes glabrous or minutely ciliate, rigid, the nerves inconspicuous except at the end, with 3 short, acute, nearly equal prominently 1-nerved teeth.

N. Australia. Arnhem S. Bay, *R. Brown;* Upper Victoria River, Hooker and Sturt's Creeks, *F. Mueller.*

6. **T. microstachya,** *R. Br. Prod.* 182.—Stems tall. Leaves long, convolute and usually pungent-pointed. Panicle very narrow, 6 in. to 1 ft. long, with very numerous small spikelets on erect slender branches, the lower branches sometimes distant, in other specimens crowded from the base, the rhachis usually very scabrous. Spikelets nearly sessile, 3- to 5-flowered, 1½ to 2½ lines long. Outer glumes nearly as long as the spikelet, acutely acuminate. Flowering glumes glabrous or nearly so, obtuse with 3 short teeth, the lateral ones very obtuse, the central more acute, the 3 nerves distinct nearly to the base of the glume.—*Festuca microstachya,* F. Muell. Veg. Chath. Isl. 60.

N. Australia. Islands off Arnhem's Land, *R. Brown;* North-west coast, *A. Cunningham;* Upper Victoria River, *F. Mueller.*

SUBTRIBE II. CHLORIDEÆ.—Spikelets 1-or several-flowered, usually small, sessile in simple secund or unilateral spikes, which are either solitary or digitate or scattered on a common rhachis. Flowering glumes usually keeled, entire and unawned or with 1, rarely 3, untwisted awns.

71. MICROCHLOA, R. Br.

Spikelets 1-flowered, awnless, sessile on one side of a simple slender spike, the rhachis of the spikelet articulate above the outer glumes, and not produced beyond the flower. Outer empty glumes 2, linear, membranous, nearly equal, persistent, the lowest flat with a prominent midrib, the 2nd keeled. Flowering glume shorter, broader, thin and hyaline. Palea nearly as long, narrow. Grain smooth, enclosed in the glume and palea, free from them.

The genus consists of very few species spread over the tropical and subtropical regions of the New and the Old World, the Australian species having the general range of the genus. The very thin and reduced flowering glume and palea connect it with Andropogoneæ, but the articulation of the spikelet is above not below the outer glumes.

1. **M. setacea,** *R. Br. Prod.* 208.—Stems slender, tufted, from 3 or 4 to 8 or 9 in. high. Leaves convolute when dry and almost filiform. Spike 1 to 3 in. long, very slender and curved. Spikelets appressed to the rhachis, rather more than 1 line long. Outer glumes narrow and rather acute; flowering glume very obtuse, the edges fringed with long cilia. Palea prominently 2-nerved, the nerves very near together, ciliate with a few long hairs. Grain oblong, smooth.—Kunth, Enum. i. 258; *Rottboellia setacea,* Roxb. Corom. Pl. t. 132.

N. Australia. Arnhem N. Bay, *R. Brown.* Not seen in any other Australian collection and the above character taken from Indian specimens, where it is widely spread, as well as in tropical Africa and America.

72. CYNODON, Pers.

Spikelets 1-flowered, awnless, singly sessile in 2 rows on one side of slender spikes, digitate at the end of the peduncle, the rhachis of the spikelet articulate immediately above the outer glumes, and either not produced beyond the flower or continued into a minute point behind the palea. Outer empty glumes 2, keeled, persistent or deciduous. Flowering glume broader, boat-shaped, with a prominent keel. Palea narrow or rather broad, the 2 nerves prominent, distant or closely contiguous. Grain smooth, enclosed in the glume and palea, but free from them.

A genus of very few species, and perhaps none really distinct besides the Australian ones. Of these one is a common weed spread over all hot countries, another appears to be the same as an East Indian one, the two others are, as far as known, endemic.

Flowering glume longer than the outer ones. Palea folded, with a small bristle or point behind it . . . . 1. *C. dactylon.*
Flowering glume much shorter than the outer ones, and no point behind it.
  Flowering glume pubescent. Palea with 2 prominent distant nerves . . . . 2. *C. tenellus.*
  Flowering glume ciliate with long hairs on the keel and margins. Palea very narrow, the 2 nerves closely contiguous, forming a ciliate keel . . . . 3. *C. convergens.*
  Flowering glume with a horizontal ring of long spreading hairs below the point. Palea rather broad, with 2 distant nerves, and a ring of hairs like the flowering glume . . . . 4. *C. ciliaris.*

1. **C. dactylon,** *Pers.; Kunth, Enum.* i. 259.—Stems prostrate, often creeping and rooting to a great extent, the flowering branches shortly ascending. Leaves short, of a glaucous green. Spikes 2 to 5, often purplish, 1 to 2 in. long. Spikelets sessile, outer glumes narrow, acute, persistent, keeled, under 1 line long. Flowering glume rather above 1 line long, broadly boat-shaped, the keel usually minutely ciliate. Palea narrow. Rhachis of the spikelet produced into a point or bristle shorter than the glume, and often very minute.—R. Br. Prod. 187; F. Muell. Fragm. viii. 113; Reichb. Ic. F. Germ. t. 26; *Panicum dactylon*, Linn.; Sibth. Fl. Gr. t. 60.

Queensland. Port Curtis, *M'Gillivray;* Moreton Bay, *F. Mueller* and others; Rockhampton and neighbouring districts, *O'Shanesy*, *Thozet*, *Bowman*.

N. S. Wales. Port Jackson, *R. Brown* and others; New England, *C. Stuart;* Richmond River, *Mrs. Hodgkinson;* Illawarra, *Johnson;* Lord Howe's Island, *Fullagar*.

Victoria. Yarra River and Port Phillip to the Murray, *Robertson*, *F. Mueller* and others (very frequently with only 2 spikes).

S. Australia. St. Vincent's Gulf to the Murray, *F. Mueller* and others.

W. Australia. King George's Sound and adjoining districts, *F. Mueller*, *Oldfield*, *Preiss*, *n.* 1844, *Drummond*, *n.* 346.

Var. *pulchellus*, F. Muell. Flowering glume ciliate on the keel with long hairs.—Murray River, *Dallachy*.

The species is a common and troublesome weed in all hot and some temperate countries, and although now generally spread over the settled parts of extratropical Australia, it may have been introduced with cultivation as suggested in R. Brown, Herb.

2. **C. tenellus,** *R. Br. Prod.* 187.—Stems creeping and rooting at the base as in *C. dactylon*, but usually much longer. Leaves narrow, rather long. Spikes slender, 3 to 6, digitate, 3 to 4 in. long in Mueller's specimens, shorter in Brown's. Outer glumes about 1 line long, narrow, rather obtuse, with a prominent ciliate keel. Flowering glume shorter and not broader, obtuse, pubescent, the rhachis of the spikelet not produced behind it.—*C. altior*, F. Muell. Fragm. viii. 113.

N. Australia. Arnhem S. Bay, *R. Brown;* Upper Victoria River, *F. Mueller.*

Kunth's plate 133 of his Revis. Gram. is generally quoted for this species, and the analysis at the base as well as the description in the text are quite correct, but, by some mistake of the artist, the figure itself represents a totally different plant, *Pennisetum cenchroides.*

3. **C. convergens,** *F. Muell. Fragm.* viii. 113.—A decumbent or creeping grass with the habit of *C. dactylon* or in many specimens shortly erect, apparently without stolones, glabrous except a few hairs at the orifice of the sheaths. Spikes 3 or rarely only 2, 1 to 1½ in. long, the rhachis flat and rather broad; spikelets normally in 2 rows but alternately curved inwards so as to appear almost uniseriate. Outer glumes 1½ to nearly 2 lines long, narrow, glabrous, the green keel prominent and sometimes bearing a narrow whitish wing, the glumes much less persistent than in the other species. Flowering glume about half as long, thin and hyaline, ciliate on the keel and margins with long hairs. Palea very narrow, the 2 nerves closely contiguous and almost consolidated into a single one, ciliate with long hairs, the rhachis of the spikelet not produced behind it.

N. Australia. Upper Victoria River, *F. Mueller*
N. S. Wales. Cabramatta, *Woolls.*

4. **C. ciliaris,** *Benth.*—A dwarf species, with the creeping habit of *C. dactylon,* the erect flowering stems 2 to 3 in. high in our specimens. Leaves short, the sheaths ciliate with long fine spreading hairs. Spikes 2, 1 to 1½ in. long, rather more rigid than in *C. convergens.* Spikelets rather smaller, converging in 2 rows on a flattened rhachis, the rhachis of the spikelet not produced above the flowering glume. Outer glumes 1½ lines long, the keel acute but scarcely winged. Flowering glume broad and very concave, much shorter than the outer ones, shortly ciliate on the keel and margins, with a transverse ring of long spreading hairs near the end. Palea not much narrower than the glume, with a similar ring of hairs, the 2 nerves not closely contiguous.

Central Australia. Charlotte Waters, *Giles.*

73. CHLORIS, Linn.

Spikelets 1-flowered, awned, singly sessile in 2 rows on one side of simple spikes, either solitary or digitate at the end of the peduncle, the rhachis of the spikelet articulate immediately above the outer glumes. Outer empty glumes 2, keeled, persistent, awnless. Flowering glume produced into a fine straight awn, entire or with a tooth lobe or short awn on each side of the terminal awn. Palea folded or with 2 prominent nerves. Rhachis of the spikelet produced behind the palea and bearing 1 or more empty glumes, all awned and usually with their ends on a level with that of the flowering glume.

A rather large genus, widely spread over the warmer regions of the globe. Of the nine Australian species one only has been satisfactorily matched with a common

Asiatic and African one, another comes near to an Indian species, the remainder are all endemic.

Spike solitary, slender. Flowering glume narrow . . . . 1. *C. unispicea.*
Spikes digitate, slender. Spikelets acute. Flowering glume usually with a tooth lobe or short awn on each side of the terminal one.
Spikes few, about 1 in. long. Lobes of the flowering glume awned . . . . 2. *C. pumilio.*
Spikes numerous, 2 to 3 in. long. Spikelets closely approximate and regularly pectinate. Flowering glume 2-fid, unawned, usually scabrous . . . . 3. *C. pectinata.*
Spikes 6 to 12 or more, 3 to 6 in. long.
Spikelets rather crowded, 2 lines long. Flowering glume with a fine tooth or point on each side of the awn . 4. *C. divaricata.*
Spikelets distant, 3 lines long. Flowering glume tapering into the awn or very minutely toothed . . . . 5. *C. acicularis.*
Spikes digitate, slender, 3 to 6 in. long. Spikelets very obtuse or truncate.
Spikelets cuneate, truncate, 1 to 1¼ lines long. Flowering glume oblong, obtuse. Upper empty one broad, truncate . . . . 6. *C. truncata.*
Spikelets very obtuse, 1¼ to 2 lines. Flowering glume very broad, embracing the narrower empty one . . . . 7. *C. ventricosa.*
Spikes digitate, dense, 1 to 2 in. long.
Flowering glume membranous, rather acute. Upper empty glume solitary, truncate . . . . 8. *C. barbata.*
Flowering glume broad, rigidly scarious, ciliate. Upper empty glumes several, broad, scarious, very spreading . 9. *C. scariosa.*

1. **C. unispicea,** *F. Muell. Fragm.* vii. 118.—A slender grass, from 6 in. to above 1 ft. high, glabrous except long hairs at the orifice of the sheath, branching at the base and densely tufted. Leaves short, setaceous, crowded at the base of the stem, the upper ones few and capillary. Spike single, erect, unilateral, 1½ to 4 in. long. Outer glumes very narrow, hyaline, acuminate, the lowest about 1½ lines, the 2nd at least 2 lines long. Flowering glume on a hairy stipes, narrow, thin, faintly 3-nerved, tapering at the top, nearly as long as the outer glume, entire, with a fine awn of 2 to 3 lines. Terminal empty glume narrow, with a fine awn sometimes as long as, sometimes much shorter than that of the flowering glume.

Queensland. Herbert's Creek, *Bowman.*

2. **C. pumilio,** *R. Br. Prod.* 186.—A small glabrous grass, our specimens 4 to 8 in. high, with the foliage of a *Cynodon.* Spikes 3 to 5, about 1 in. long. Spikelets narrow and crowded but all turned to one side, about 2 lines long without the awn. Outer glumes very narrow, fine-pointed, the longest scarcely 1 line long. Flowering glume lanceolate, scarcely ciliate, deeply divided into 2 narrow lanceolate lobes produced into awns either very short or nearly as long as the central one which varies from 1½ to 4 lines long. Terminal empty glumes 2 or 3, lanceolate and awned.

N. Australia. Islands off the north coast, *R. Brown;* Norman River, *Gulliver.*

3. **C. pectinata,** *Benth.*—Stems 1 to 1½ ft. high, with the flat leaves and loose sheaths of *C. barbata*. Spikes 7 to 14, 2 to 3 in. long, the spikelets very numerous, narrow, elegantly arranged in a single dense row. Outer glumes very narrow, almost subulate. Flowering glume very narrow, smooth or scabrous, scarcely ciliate, with 2 narrow lobes acute or produced into very short points, the intermediate almost dorsal awn very fine, 3 to 4 lines long. Terminal empty glume bifid, with a dorsal awn.

Queensland. Cashmere, *Armit*, with purple awns and rather smaller awns.
Central Australia. Charlotte Waters, *Giles*, with pale-coloured awns.

The species is intermediate as it were between *C. pumilio* and *C. divaricata.*

4. **C. divaricata,** *R. Br. Prod.* 186.—A glabrous erect tufted grass of 1 to 2 ft. Leaves narrow, flat or convolute, the sheaths often much flattened. Spikes 6 to 12, slender, 3 to 6 in. long. Spikelets very numerous but not crowded, rarely 2 lines long without the awns. Outer glumes unequal, very narrow, finely pointed. Flowering glume narrow, keeled, 3-nerved, the fine awn 3 to 6 lines long, with a point or narrow lobe on each side. Terminal empty glume broadly linear, 2-lobed, with an awn between the lobes sometimes as long as that of the flowering glume.

N. Australia. Sturt's Creek, *F. Mueller* (a tall form with long awns).
Queensland. Keppel and Shoalwater Bays and Broad Sound, *R. Brown*; Rockhampton and neighbouring districts, *Bowman*, *Thozet*, *O'Shanesy* and others; Moreton Bay, *C. Stuart*.

5. **C. acicularis,** *Lindl. in Mitch. Trop. Austr.* 33.—A glabrous erect grass of 1 to 2 ft. Leaves flat, the lower sheaths broad and flattened. Spikes 6 to 12 or even more, at first erect but at length horizontally spreading as in *C. divaricata*, 3 to 4 in. long, slender and often purplish. Spikelets rather distant. Outer glumes narrow, keeled, tapering to fine points, the lowest 1½ to 2 lines, the 2nd 3 lines long. Flowering glume about 2 lines, narrow, 3-nerved, tapering into an awn of about ½ in., with sometimes but not always a short point on each side at the base. Palea long, narrow, prominently 2-nerved. Terminal empty glume with an awn sometimes as long as that of the flowering glume but usually shorter.—*C. Moorei*, F. Muell. in Linnæa, xxv. 444.

N. S. Wales. In the interior, *Mitchell*; Armadillo, *Barton*; Murray and arling Rivers to the Western frontier, *Victorian* and other expeditions; also in *Leichhardt's* collection.
S. Australia. Head of St. Vincent's Gulf and Murray River, *F. Mueller*; near Lake Eyre, *Andrews*; Alice Springs and Charlotte Waters, *Giles*.
W. Australia. Fraser's Range, *Dempster*.

Nearly allied to but appears distinct from the E. Indian *C. Roxburghiana*, Edgew.

6. **C. truncata,** *R. Br. Prod.* 186.—A glabrous erect grass of 1 to 3 ft. Leaves usually flat but narrow, with flattened sheaths. Spikes

6 to 10, slender, 3 to 6 in. long, at length horizontally spreading. Spikelets numerous but not crowded, cuneate, 1 to 1½ lines long without the awns. Lowest outer glume very small, almost setaceous, the 2nd narrow and fine pointed, about as long as the spikelet. Flowering glume oblong, obtuse, keeled, slightly ciliate, with a fine awn of 3 to 6 lines. Terminal empty glume much shorter and broader, raised to the level of the flowering glume and flat-topped, giving the spikelet its cuneate truncate form.—Kunth, Rev. Gram. t. 178.

Queensland. Condamine River and Bokhara Flats, *Leichhardt.*
N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and others; abundant in the West Interior, *A. Cunningham* and many others; New England, *C. Stuart;* Hastings and Clarence Rivers, *Beckler* and others.
S. Australia. St. Vincent's Gulf, *F. Mueller.*

Specimens from Darling River in Herb. F. Mueller have denser spikes not exceeding 2 in. in length, but do not otherwise differ from the typical ones. The species has been long in cultivation in Continental Botanic Gardens, and has appeared as a weed in kitchen gardens at Constantinople, and is known as *C. elongata*, Poir., and *C. dolichostachya*, Lag., and described by Trinius, Gram. Unifl. 235, under the latter name partly from garden, partly from Port Jackson specimens. Poiret described his *C. elongata* from a Timor specimen, Lagasca gives the Philippines as the station for *C. dolichostachya.* We have no specimen from either locality, and the diagnoses neither of Poiret nor of Lagasca are sufficient for identification, but, as far as they go, apply well to the plant.

7. **C. ventricosa,** *R. Br. Prod.* 186.—Usually rather taller than *C. truncata*, often above 2 ft. high, with few flat leaves. Spikes 5 to 7 in the typical specimens, 3 to 4 in. long. Spikelets cuneate and obtuse as in *C. truncata*, but larger, from 1½ to 2 lines long, and often but not always dark-coloured. Flowering glume broad, very obtuse, embracing the much smaller terminal one, which is raised and truncate as in *C. truncata*, usually emarginate, the awns of both much shorter than the spikelet.—*C. sclerantha*, Lindl. in Mitch. Trop. Austr. 31.

Queensland. Bokhara Flats, *Leichhardt;* Bowen Downs, *Birch.*
N. S. Wales. Richmond, *R. Brown;* Armadillo, *Barton;* Western interior, *A. Cunningham;* Bogan River, *Mitchell.*

Var. *tenuis.* Stems 1 to 1½ ft. high. Leaves short and narrow. Spikes 3 to 5, about 2 in. long. Spikelets smaller with longer awns, but with the broad flowering glume embracing the barren terminal one as in the typical form.—Rockhampton, *O'Shanesy;* Nerkool Creek, *Bowman.*

Another long-awned form has spikes of 3 to 4 in., from Cabramatta and Ash Island, *Woolls;* Bowen Downs, *Birch.*

8. **C. barbata,** *Sw.; Kunth, Enum.* i. 264, *var.* decora.—A glabrous grass with flat leaves and loose leaf-sheaths, closely resembling the common *C. barbata*, but the spikes dense, the awns longer and only one terminal empty glume instead of the two of the typical form. Spikes 6 to 10, 1½ to 2 in. long. Outer glumes 1 to 1½ lines long, narrow, thin and hyaline, the 2nd keeled and tapering into a fine point.

Flowering glume not broad, membranous, keeled, ciliate at the end with long hairs and slightly so on the margins, rather acute, sometimes notched, the awn very fine, 3 to 4 lines long. Terminal empty glume very obtuse or truncate, slightly emarginate, the awn nearly as long as that of the flowering glume.—*C. decora*, Nees in Steud. Syn. Glum. i. 205.

Central Australia, *Gosse;* Stephenson's River, *M'Douall Stuart* (single specimens in Herb. F. Mueller).

The species is a widely spread tropical one, though usually with 2 empty glumes above the flowering one, the above quoted *C. decora*, Nees, however, from East India, scarcely differs from the Australian variety in its rather shorter awns. A S. African plant, apparently the same as the *C. compressa*, DC., described from garden specimens, exactly resembles the Australian one, except that the leaves are ciliate with long hairs of which there is no trace in the var. *decora*.

9. **C. scariosa,** *F. Muell. Fragm.* vi. 85.—Stems erect, slender but rigid, 1 to 2 ft. high. Leaves narrow with subulate points or almost entirely flat in the larger specimens, glabrous. Spikes 4 to 6, dense, 1 to 1½ in. long. Spikelets sessile, 3 to 4 lines long. Lowest glume narrow, hyaline, almost obtuse, scarcely keeled, about 2 lines long, the 2nd rather longer with a more prominent keel. Flowering glume raised on a hairy rhachis of about 1 line, rather above 1 line long, very broad and concave, prominently 3-nerved, ciliate with long hairs at the end, with a fine awn of 2 to 3 lines. Terminal empty glumes several (4 to 7), the lowest two broader than the flowering one, 5- to 7-nerved at the base, hyaline and not ciliate, very spreading and at length rigidly scarious, the upper ones gradually smaller sessile and not exceeding the outer ones.

N. Australia. Sturt's Creek, *F. Mueller*.

Queensland. Rockhampton, *O'Shanesy;* Gracemere, *Bowman;* Bowen Downs, *Birch*.

There are one or two East Indian species with broad scarious empty glumes, but they do not exactly correspond with the Australian one.

74. ELEUSINE, Gærtn.

(Dactyloctenium, *Willd.* Acrachne, *Nees.*)

Spikelets several-flowered, flat, imbricate in 2 rows along one side of the digitate or scattered branches of a simple panicle, the rhachis of the spikelet articulate above the outer glumes. Glumes spreading, keeled and complicate, thin but rigid, the 2 outer empty ones usually shorter, unequal, obtuse, acute or tapering to a short point. Flowering glumes obtuse or less pointed, the terminal one usually empty or rudimentary. Palea folded. Styles short, distinct. Seed rugose within a loose membranous pericarp, which either persists round the ripe seed or breaks up and falls away or otherwise disappears as the ovary enlarges.

A small widely spread tropical genus. Of the three Australian species two are common weeds in warm countries, the third extends over tropical Asia and Africa.

Spikes digitate, short. Spikelets very closely packed, the glumes very pointed, the 2nd outer one almost awned. Pericarp evanescent	1. *E. ægyptiaca.*
Spikes digitate or with one lower down, 2 to 3 in. long. Glumes obtuse. Pericarp persistent	2. *E. indica.*
Spikes 6 to 12, scattered or the upper ones digitate. Glumes pointed, the flowering ones with a small tooth on each side of the point. Pericarp evanescent	3. *E. verticillata.*

1. **E. ægyptiaca,** *Pers. Syn.* i. 82.—Stems tufted or creeping and rooting at the base and shortly ascending like the *Cynodon dactylon*, or rarely above 1 ft. high. Leaves flat, ciliate, flaccid, with long points. Spikes usually 3 to 5, digitate, under ½ in. in most of the Australian specimens but sometimes 1 in. long, the angular rhachis prominent on the upper or inner side, the spikelets regularly and very closely packed at right angles to it on the opposite side. Outer glume about 1 line long, acute, the 2nd broader, obtuse or emarginate, the keel produced into a short dorsal awn, the rhachis of the spikelet produced above the outer glumes but glabrous. Flowering glumes broad, complicate, tapering into short spreading points. Pericarp loose over the enlarged ovary, disappearing from the ripe rugose seed.—Pluk. Almag. t. 300, f. 8; *Cynosurus ægyptius*, Linn. Spec. 106; *Dactyloctenium ægyptiacum*, Willd.; Kunth, Enum. i. 261; *Eleusine cruciata*, Lam.; F. Muell. Fragm. viii. 111; *E. radulans*, R. Br. Prod. 186; *Dactyloctenium radulans*, Beauv.; Kunth, Enum. i. 262.

N. Australia. Gulf of Carpentaria, *R. Brown*, *Gulliver;* Sir Charles Hardy's Island, *Henne;* Port Essington, *Armstrong;* Victoria River, *F. Mueller;* Dampier's Archipelago, *Walcot.*

Queensland. Booby Island, *Banks and Solander;* Rockingham Bay, *Dallachy;* Herbert's and Nerkool Creeks, *Bowman;* Gracemere, *O'Shanesy;* Balandool River, *Lockyer;* Barcoo, *Schneider.*

N. S. Wales. Darling River and Maranoa, *Woolls.*

Central Australia. Near Lake Eyre, *Andrews, Giles.*

A common weed of warm countries.

2. **E. indica,** *Gærtn.; Kunth, Enum.* i. 272.—A coarse erect tufted grass 1 to 2 ft. high. Leaves narrow, the sheaths flattened and distichous, ciliate with a few long hairs. Spikes 5 to 7, 2 to 3 in. long, digitate, with usually one inserted rather lower down, the rhachis prominent on the upper or inner side, the spikelets loosely imbricate on the opposite side. Each spikelet 1½ to 2 lines long, containing 3 to 5 flowers. Glumes obtuse, the lowest small and 1-nerved, the 2nd empty one and the lower flowering ones usually 3-nerved. Pericarp persistent, very loose and membranous, enclosing the rugose seed.—

Trin. Spec. Gram. t. 71; F. Muell. Fragm. viii. 112; *E. marginata*, Lindl. in. Mitch. Three Exped. i. 319.

Queensland. Moreton Bay, *Leichhardt*, *Bailey;* Rockhampton, *O'Shanesy*, *Thozet;* Nerkool Creek, *Bowman*.
N. S. Wales. Tweed River, *C. Moore*, *Eaves*.

A common tropical and subtropical weed.

3. **E. verticillata,** *Roxb.; Fl. Ind. ed. Car. et Wall.* i. 346.—An erect annual of 1 to $1\frac{1}{2}$ ft., with the habit of *E. indica*. Leaves flat, with loose flattened sheaths. Spikes or panicle-branches 6 to 12 or even more, varying from 1 to 3 in. long, the lower ones distant or verticillate, the upper ones almost digitate. Spikelets 2 to 3 lines long, 8- to 12-flowered. Outer empty glumes small and narrow, the lowest almost subulate, the 2nd lanceolate, keeled, with a fine point. Flowering glumes rather above 1 line long, broad and 3-nerved, the keel produced into a short point, the lateral nerves ending usually in a small tooth on each side of the point. Pericarp loose over the enlarged ovary, disappearing from the rugose seed.—F. Muell. Fragm. viii. 112; *E. racemosa*, Roth, Nov. Sp. Pl. 80; *Leptochloa verticillata* and *L. racemosa*, Kunth, Enum. i. 272; *Acrachne eleusinoides*, Nees in Herb. Wight, n. 118 and 1760.

N. Australia. Dampier's Archipelago and Exmouth Gulf, *Walcot*.
Queensland. Bowen River, *Bowman*.

Widely spread over tropical Asia and Africa.

75. LEPTOCHLOA, Beav.

Spikelets several-flowered or rarely 1-flowered, sessile in 2 rows along one side of the slender usually numerous branches of a simple panicle, the rhachis of the spikelet articulate above the outer glumes and more or less produced above the flowering ones. Glumes keeled, acute or obtuse, unawned, the 2 outer empty ones shorter or rarely as long as the flowering ones. Palea prominently 2-nerved or folded. Grain smooth or nearly so, the pericarp very thin and adnate.

The genus is generally spread over tropical and subtropical regions both in the New and the Old World. Of the three Australian species two are also East Indian, the other is endemic. They have been placed the one in *Cynodon*, the two others in *Poa*, differing from both genera more in inflorescence than in the structure of the spikelets.

Spikelets 5- or 6-flowered. Flowering glumes rather obtuse.
  Spikes dense, mostly crowded at the end of the rhachis . 1. *L. subdigitata*.
  Spikes slender, scattered along the long slender rhachis . 2. *L. chinensis*.
Spikelets 1-flowered. Flowering glumes acute. Spikes slender, scattered along the long slender rhachis . . 3. *L. polystachya*.

1. **L. subdigitata,** *Trin. in Steud. Syn. Glum.* i. 210.—An erect rigid usually glaucous grass, attaining 4 or 5 ft. Leaves short, with rigid rather loose sheaths. Spikes or panicle-branches 6 to 10, crowded at the end of the peduncle with usually 1 or 2 lower down, 2 to 4 in. long. Spikelets 1½ or rarely 2 lines long, 5- or 6-flowered, the rhachis bearing a few short hairs under each glume. Glumes about ½ line long, obtuse or almost acute, the outer empty ones usually rather smaller, especially the lowest. Palea folded. Grain oblong, perfectly smooth, the pericarp very thin and adnate.—*Poa digitata*, R. Br. Prod. 182; *Eleusine digitata*, Spreng. Syst. Cur. Post. 36; F. Muell. Fragm. viii. 112; *E. polystachya*, F. Muell. Fragm. i. 216.

N. Australia. Sturt's Creek, *F. Mueller*; Upper Murchison and Warren Rivers, *Walcot.*

Queensland. Suttor River, *F. Mueller;* Gracemere, *O'Shanesy;* Darling Downs, *Law.*

N. S. Wales. Glendon and Cassilis, *Leichhardt;* Armadillo, *Barton;* Lachlan River, *Fraser;* Castlereagh River, *Woolls;* Darling River to Cooper's Creek, *Neilson.*

Central Australia. M'Donnel Ranges, *Giles.*

W. Australia. Upper Murchison and Warren Rivers, *Walcot.*

2. **L. chinensis,** *Nees; Steud. Syn. Glum.* i. 209.—Stems from a creeping and rooting base ascending to 2 or 3 ft., glabrous and usually slender. Leaves narrow, flat, tapering to a point. Panicle 6 in. to above 1 ft. long, the numerous simple branches scattered or clustered along the rhachis, very slender, 2 to 4 in. long, or in the smaller weaker specimens under 2 in. Spikelets sessile or nearly so, distant or rather crowded, narrow, 1 to 2 lines long, usually 4- to 6-flowered. Outer empty glumes rather unequal, acute, flowering ones broader, obtuse.—*Poa chinensis*, Kœn.; F. Muell. Fragm. viii. 132; *Leptochloa tenerrima*, Rœm. and Schult.; Kunth, Enum. i. 270; *Poa decipiens*, R. Br. Prod. 181; *Eragrostis decipiens*, Steud. Syn. Glum. i. 279.

Queensland. Keppel Bay, *R. Brown;* Brisbane River, Moreton Bay, *Leichhardt*, *C. Stuart*, *Bailey*; Bokhara Flats, *Leichhardt*; Rockhampton and neighbouring districts, *Bowman*, *O'Shanesy.*

N. S. Wales. New England, *C. Stuart.*

Generally spread over East India and Eastern Asia. It varies considerably in the spikelets sometimes scarcely above 1 line long and distant, in other specimens about 2 lines long and more approximate, and in the palea glabrous or ciliate on the keels.

Poa imbecilla, R. Br. Prod. 181 (*P. asthenes*, Rœm. and Schult. Syst. ii. 574; *Eragrostis imbecilla*, Steud. Syn. Glum. i. 279), from Broad Sound, *R. Brown*, is different from the *P. imbecilla*, Labill. and appears to be merely a weak slender variety of *Leptochloa chinensis*, with few distant spikes to the panicle.

3. **L. polystachya,** *Benth.*—An erect grass of 3 ft. or more, the lower nodes sometimes bearded, otherwise glabrous and glaucous. Leaves convolute with subulate points and rather loose sheaths, the lower ones flat. Spikes very numerous and slender, 1 to 2 in. long,

crowded in a long narrow simple panicle of 8 to 10 in., the common rhachis slightly flattened and striate. Spikelets 1-flowered, nearly sessile. Outer glumes ¾ to nearly 1 line long, acute, with a prominent glabrous or slightly ciliate keel. Flowering glume rather shorter, glabrous or minutely pubescent. Palea prominently 2-nerved, rhachis produced behind it into a minute point, sometimes quite obsolete, sometimes according to F. Mueller bearing an empty glume. Grain oblong, smooth, the pericarp not distinguishable when ripe.—*Cynodon polystachyus*, R. Br. Prod. 187; F. Muell. Fragm. viii. 113. *C. virgatus*, Nees in Steud. Syn. Glum. i. 213; *C. Neesii*, Thw. Enum. Pl. Ceyl. 371.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; Victoria River, *F. Mueller;* Etheridge and Gilbert Rivers, *Sullivan*.
Queensland. Burdekin River, *Bowman*.

Also in Ceylon and in the E. Indian Peninsula. I have been able to retain Brown's specific name, as the American *Diplachne panicularis*, named *Leptochloa polystachya* by Kunth, is generally retained under the former genus. Our species has been usually placed in *Cynodon*, on account of the 1-flowered spikelets, but the numerous spikes crowded on the long rhachis of the panicle give the plant a very different aspect from that of the digitate *Cynodon*, and there are one or two other species of *Leptochloa*, in which the flowers are occasionally or constantly reduced to a single one.

76. DIPLACHNE, Beauv.

Spikelets several- often many-flowered, linear, sessile or very shortly pedicellate, but distant along the rhachis of a simple spike or of the elongated branches of a simple panicle, the rhachis of the spikelet articulate and usually hairy under the flowering glumes. Outer empty glumes keeled, acute, unawned; flowering glumes with a hyaline shortly 2-lobed apex, the keel produced into a short point or awn between or shortly below the lobes. Palea thin, prominently 2-nerved. Styles short, distinct. Grain smooth, free.

A genus of few species, generally spread over the warmer regions of the globe. Of the four Australian species one has a wide range in the Old World, and is probably the same as an American one, another is closely allied to if not identical with an Indian one, the two others appear to be endemic.

Spike slender, simple . . . . 1. *D. loliiformis.*
Spikes numerous in a simple panicle.
  Spikelets pale-coloured, 5–8 lines long, 8- to 12-flowered. Rhachis with a tuft of long hairs under the glumes . . . . 2. *D. Muelleri.*
  Spikelets usually dark-coloured, 4 lines long or rather more, with more than 6 flowers, rhachis glabrous, or nearly so . . . . 3. *D. fusca.*
  Spikelets light-coloured, scarcely 3 lines long, with usually 5 or 6 flowers . . . . 4. *D. parviflora.*

1. **D. loliiformis**, *F. Muell.*—A slender apparently annual erect grass, usually 6 to 8 in. but a few specimens above 1 ft. high. Leaves

chiefly at the base, short and narrow, usually sprinkled with a few long hairs, the sheaths ciliate at the orifice, with a short jagged ligula. Spike slender and simple, 2 to 4 in. long, on a long peduncle. Spikelets sessile, rather distant, erect and appressed, turned somewhat to one side, narrow, 3 to 4 lines long, 6- to 12-flowered, the rhachis hairy round the flowering glumes. Flowering glumes about 1 line long, glabrous, 3-nerved, the central nerve produced into a fine point or awn shortly exceeding the hyaline lobes.—*Festuca* or *Leptochloa loliiformis*, F. Muell. Fragm. viii. 128.

Queensland. Moreton Bay and Charley's Creek, *Leichhardt;* various localities about Rockhampton, *Bowman, O'Shanesy.*

Central Australia. Between Alice Springs and Charlotte Waters, *Giles*, the specimens rather more robust.

The species is closely allied to an apparently unpublished East Indian one.

2. **D. Muelleri,** *Benth.*—A glabrous erect grass of about 1½ ft. nearly allied to *D. fusca*, with a similar foliage and inflorescence, but the spikelets fewer, pale-coloured, 5 to 8 lines long, with 8 to 12 flowers. Flowering glumes surrounded by a tuft of rather long hairs and the margins ciliate below the middle, the point of the keel scarcely exceeding the hyaline margins, and the lateral nerves occasionally produced into minute points. Grain narrow-obovate, flattened.

N. Australia. Sturt's Creek, *F. Mueller.*

Central Australia. Charlotte Waters, *Giles.*

3. **D. fusca,** *Beauv. Agrost.* 163.—A glabrous erect grass of several feet. Leaves narrow, convolute when dry, with long loose sheaths, the ligula jagged. Panicle narrow, 6 in. to 1 ft. long, with erect branches, the lower ones long. Spikelets sessile or nearly so, rather distant, erect, linear, 6- to 10-flowered, about 4 lines long or rather more and straw-coloured, or longer and dark, the rhachis glabrous or slightly hairy under each glume. Flowering glumes nearly 2 lines long, shortly ciliate on the margins in the lower part, prominently 3-nerved, the keel produced into a short point between or just below the short hyaline terminal lobes. Keels of the palea shortly ciliate.—*Festuca fusca*, Linn.; F. Muell. Fragm. viii. 127; *Leptochloa fusca*, Kunth, Enum. i. 271; *Triodia ambigua*, R. Br. Prod. 183; *Uralepis fusca* and *U. Drummondii*, Steud. Syn. Glum. i. 247.

N. Australia. Victoria River, *F. Mueller.*

Queensland. Keppel Bay, *R. Brown;* Bokhara Flats, *Leichhardt.*

N. S. Wales. Lachlan River, *A. Cunningham;* Darling River, *Mrs. Forde.*

Central Australia. Lake Eyre, *Andrews.*

W. Australia, *Drummond, n.* 388.

F. Mueller appears to be right in identifying this with a widely spread African species, which is also in East India and is very little different from the original American *D. fascicularis.*

4. **D. parviflora,** *Benth.*—A glabrous erect grass of 2 or 3 ft. Leaves convolute, with long rather loose sheaths, the ligula jagged. Panicle narrow, dense, varying from 3 to 10 in., with long erect simple branches. Spikelets very numerous, sessile or nearly so, 3 to 4 lines long, very narrow, 5- to 7-flowered. Outer glumes about 1½ lines long. Flowering glumes rather shorter, glabrous on the back, the margins ciliate, the lateral nerves scarcely distinct, the keel produced into a short point, the lateral hyaline lobes adnate to it almost to the top.—*Triodia parviflora,* R. Br. Prod. 182; *Festuca Brownii,* F. Muell. Fragm. viii. 129.

N. Australia. Arnhem S. Bay, *R. Brown;* North West Coast, *Hughan.* With the latter specimens are some short barren stems with short spreading rigid leaves, but they may not belong to the same species, as the sheaths are slightly viscid and there is no jagged ligula.

SUBTRIBE III. MILIEÆ.—Spikelets 1- or 2-flowered, usually small in a loose or narrow and dense panicle, the rhachis of the spikelet not produced beyond the upper flower. Outer glumes usually broad and several-nerved or almost nerveless, unawned. Flowering glumes nearly similar, unawned or with one untwisted awn. Palea often as large as the glume. Grain free.

The genera here collected, together with *Milium* and a few others not Australian, appear to me to form a fairly limited and not unnatural group. They have been generally dispersed in Paniceæ, Agrostideæ, and Festucaceæ, but they have neither the articulate pedicel of the first, nor the twisted awn and reduced palea of the second, nor the terminal bristle or empty glume so general in Festucaceæ.

77. SPOROBOLUS, R. Br.

(Vilfa, *Beauv.*)

Spikelets small, 1-flowered, nearly sessile or pedicellate in a narrow spikelike or loose and pyramidal panicle, the rhachis of the spikelet very short, glabrous, scarcely articulate, not continued beyond the flower. Glumes 3, persistent or separately deciduous, unawned, slightly keeled or convex and obscurely nerved, 2 outer empty ones usually unequal; flowering glume as long or longer. Palea about as long as the glume, with 2 nerves usually prominent, and readily splitting between them. Styles very short. Grain free, readily falling away from the glume, the pericarp loosely enclosing the seed or very thin and evanescent.

The genus is widely spread over the tropical and some more temperate regions of both the New and the Old World. Of the six Australian species, two have a general range over the area of the genus, a third extends over East India, the three others appear to be endemic, but come very near to some Asiatic species.

Beauvois, and after him Trinius, have replaced Brown's name *Sporobolus* by *Vilfa* of Adamson, on the ground of priority, but Adamson's character is far too vague to be recognised as generic, and of the two species of Caspar Bauhin's which he refers to, p. 618 of his "Familles," one is said by Bauhin to be a common weed of cultivation in Germany, Belgium and England, the other a very tall European aquatic or marsh grass with a large panicle. Neither therefore can well be congeners of Brown's *Sporobolus.*

Panicle narrow, spikelike, continuous or interrupted, the short erect branches flowering from the base.
  Outer and flowering glumes nearly equal. Leaves usually short rigid and spreading . . . . 1. *S. virginicus.*
  Outer glumes unequal, shorter than the flowering one. Leaves rather long . . . . 2. *S. indicus.*
Panicle narrow, loose, with short spreading scattered branches . . . . 3. *S. diander.*
Panicle loosely pyramidal, the branches spreading in regular distant whorls.
  Spikelets loosely pedicellate, minute.
    Leaves rigidly ciliate. Glumes obtuse . . . . . 4. *S. pulchellus.*
    Leaves not at all or minutely ciliate. Glumes narrow, acute . . . . 5. *S. Lindleyi.*
  Spikelets nearly sessile, crowded along the branches . 6. *S. actinocladus.*

1. **S. virginicus,** *Kunth, Enum.* i. 210.—Stems much branched and leafy at the base, erect or decumbent, 6 to 10 in. or rarely 1 ft. high. Leaves short and narrow, often very spreading, convolute when dry, rather rigid, glabrous or ciliate at the base. Panicle rather dense, narrow and spikelike or rather more branched at the base, 1 to 1½ in. long, often rather dark coloured. Glumes keeled, rather acute, about 1 line long, the 2 outer and the flowering one similar or the lowest rather smaller. Palea rather longer, the 2 nerves close together so as to represent a broad keel, but very readily splitting showing an inflexed margin between the nerves. Grain broadly obovoid, the very thin pericarp separable when soaked but undistinguishable in the dried state.—*Agrostis virginica*, Linn.; Labill. Pl. Nov. Holl. i. 20, t. 23; R. Br. Prod. 170; *Vilfa virginica*, Beauv.; Trin. Spec. Gram. t. 48.

Queensland. Port Curtis, *M'Gillivray.*

N. S. Wales. Near salt marshes, *Woolls;* beach near Bulli, *Johnson.*

Victoria. Port Phillip, *R. Brown;* along the coast from the Glenelg to Snowy River, *Robertson, F. Mueller* and others.

S. Australia. Port Lincoln, *R. Brown;* round Spencer's and St. Vincent's Gulfs, *F. Mueller* and others; Fowler's Bay, *Richards.*

W. Australia. From King George's Sound, *R. Brown* and others, and Esperance Bay, *Dempster*, to Swan and Murchison Rivers, *Drummond, n.* 143, 372, *Preiss, n.* 1841, *Oldfield* and others; Sharks' Bay, *Milne.*

Var? *pallida.* Taller, often above 1 ft. high; leaves narrower and often more erect; spike looser, 2 to 4 in. long, the spikelets often small and pale coloured, Munro is inclined to think that this may be a distinct species.

N. Australia. Gulf of Carpentaria, *R. Brown; Sturt's Creek, F. Mueller;* Port Darwin, *Schultz, n.* 645, 749, 764, (also n. 212, with the foliage of the typical form but the spike 2 to 4 in. long, broad and dense.)

Queensland. Prince of Wales Island, *R. Brown;* Brisbane River, *Bailey;* Gracemere, *O'Shanesy.*

N. S. Wales. Richmond River, *Mrs. Hodgkinson;* Darling River, *Dallachy, Mrs. Ford.*

S. Australia. Murray River and Cudnaka, *F. Mueller;* Charlotte Waters, Central Australia, *Giles.*

The species is widely spread over the warmer regions of the New and the Old World, extending into South Africa and North America.

2. **S. indicus,** *R. Br. Prod.* 170.—An erect tufted grass of 1 to 2 ft., glabrous except a few cilia at the base of the leaves. Leaves chiefly at the base of the stem, narrow, ending in fine points, the upper ones few with long sheaths. Spikelike panicle very narrow, 3 to 8 in. or even longer, continuous throughout or when long often much interrupted. Spikelets very numerous, crowded along the very short erect almost imbricate or distant branches. Outer glumes almost hyaline, obtuse, 1-nerved, the lowest about ½ line, the 2nd ¾ line long; flowering glume about 1 line, of a firmer consistence, broad but almost tapering to a point, 1-nerved (the whole spikelet rather smaller in some specimens). Palea nearly as long, faintly 2-nerved. Grain broadly obovoid, the very thin pericarp sometimes appearing loose, though often evanescent or undistinguishable in the dried state.—Kunth, Enum. i. 211; *S. elongatus*, R. Br. Prod. 170; *Vilfa elongata,* Beauv.; Trin. Agrost. Vilf. 68; *Sporobolus tenacissimus*, Beauv.; Kunth, Enum. i. 211; *Vilfa tenacissima,* Trin. Spec. Gram. t. 60; *V. capensis*, Beauv.; Trin. Spec. Gram. t. 56.

Queensland. Brisbane River, Moreton Bay, *F. Mueller*, *Bailey*, *C. Stuart;* Rockhampton and neighbouring districts, *Bowman*, *O'Shanesy* and others; Bowen Downs, *Birch*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber* (Agrostoth. n. 78) and others; Macleay River, *Beckler;* New England, *C. Stuart;* Tweed River, *Eaves;* Mudgee, *Taylor;* Bulli, *Johnson;* Lord Howe's Island, *Fullagar*.

Victoria. Port Phillip, Mitta-Mitta, etc., *F. Mueller.*

Central Australia. Alice Springs, *Giles.*

W. Australia. King George's Sound, *F. Mueller.*

Generally spread over tropical and subtropical America, Africa and Asia, extending also into Norfolk Island and New Zealand.

3. **S. diander,** *Beauv.; Kunth, Enum.* i. 213.—An erect glabrous grass of 1 to 2 or even 3 ft. Leaves chiefly at the base, narrow, the upper sheaths not covering the stem. Panicle narrow but loosely pyramidal, 6 in. to above 1 ft. long, the branches scattered, at length spreading. Spikelets very shortly pedicellate or almost sessile, ¾ to 1 line long. Outer empty glumes very obtuse; hyaline, the upper one about ½ line, the other shorter. Flowering glume longer, slightly keeled, obtuse or almost acute. Palea broad, obtuse, faintly 2-nerved and not so readily splitting as in the other species. Grain broadly obovoid, the pericarp not readily separable.—*Vilfa erosa,* Trin. Agrost. Vilf. 64.

Queensland. Moreton Bay, *Leichhardt, C. Stuart.*

N. S. Wales. Macleay River, *Beckler;* Tweed River, *Guilfoyle.*

Widely spread in East India. This appears to be the true *Agrostis diandra* of Retz and König, as determined by Kunth and others, and as represented by König's specimens in the British Museum, although in Indian as well as in Australian specimens there are generally 3 stamens. The *Vilfa diandra*, Trin. or *Sporobolus diander*, Jacq. f. Ecl. Gram. t. 28, is a different plant described and figured from garden specimens, having the 2nd empty glume as long as the flowering one and probably more constantly diandrous.

4. **S. pulchellus,** *R. Br. Prod.* 170.—Stems tufted, 6 in. to 1 ft high. Leaves chiefly at the base, flat or keeled, broad or narrow, rather rigid, bordered by rigid cilia tuberculate at the base. Panicle loosely pyramidal, 2 to 5 in. long, with numerous capillary spreading branches verticillate at regular intervals. Spikelets pedicellate, not ½ line long, shining. Glumes almost hyaline, rather obtuse, slightly keeled, the 2nd outer empty one and the flowering one nearly equal and similar, the lowest empty one about half as long, narrow but obtuse. Palea very readily splitting in two. Grain globular, enclosed in a loose hyaline pericarp.—Kunth, Rev. Gram. t. 123 (an unusually narrow-leaved form and the remarkable cilia are not represented); *Vilfa pulchella*, Trin. Agrost. Vilf. 37.

N. Australia. North Coast, *R. Brown;* Upper Victoria River, *F. Mueller;* Fort Darwin, *Schultz, n.* 112; Escape Cliffs, *Hulse.*

Queensland. Endeavour River, *Banks and Solander;* Kennedy District, *Daintre;* Elliot River, *Bowman;* Peak Downs, *Slater.*

5. **S. Lindleyi,** *Benth.*—Nearly allied to *S. pulchellus.* Leaves narrow, not at all or only very shortly ciliate. Panicle very loose, broadly pyramidal, 3 to 5 in. long and broad when fully out, the branches capillary, the lower ones elongated in a dense verticil, the upper ones more scattered. Spikelets ½ to ¾ line long. Glumes very acute, the lowest outer one very small and narrow, the 2nd also empty and the flowering glume nearly equal, usually dark coloured. Palea usually divided to the base into 2 even at the time of flowering. Seed enclosed in a loose pericarp, as in *S. pulchellus.*—*S. pallidus,* Lindl. in Mitch. Trop. Austral. 187, not of Nees; *Vilfa Lindleyi,* Steud. Syn. Glum. i. 162; *S. subtilis,* F. Muell. Fragm. viii. 140, not of Kunth.

Queensland. On the Maranoa, *Mitchell;* Bokhara Flats, *Leichhardt;* Gracemere, *Bowman;* Curriwillighee, *Dalton,*

N. S. Wales. Liverpool Plains and Darling River, *Woolls.*

Victoria. Portland, *F. Mueller.*

Australia. Fraser's Range, *Dempster.*

In general this species is very distinct from *S. pulchellus,* both in foliage and in spikelets, but some specimens of Bowman's seem almost to connect the two. They are however far advanced and not perfect. Mitchell's are also far advanced and not so characteristic as younger ones.

6. **S. actinocladus,** *F. Muell.* Fragm. viii. 140.—Stems 1 to 2 ft. high. Leaves flat, tapering to fine points, glabrous. Panicle pyramidal, 3 to 5 in. long, the branches numerous, spreading, the lower ones or nearly all verticillate at regular intervals, the upper ones scattered, all capillary and shortly bare at the base, but bearing narrow dense spikelike partial panicles of ½ to 1 in. Spikelets sessile and

crowded, nearly 1 line long. Outer glume very small, hyaline, almost obtuse; 2nd very acute, keeled, ½ to ¾ line long; flowering glume similar but longer. Palea divided into 2 from the base, even at the time of flowering. Seed enclosed in a loose pericarp.—*Vilfa* or *Agrostis actinoclada*, F. Muell. Fragm. vi. 84.

N. Australia. Sturt's Creek, *F. Mueller.*
Queensland. Gracemere, *O'Shanesy;* Ballandool River, *Looker.*
Central Australia. Charlotte Waters, *Giles.*

78. MICRAIRA, F. Muell.

Spikelets 2-flowered, the flowers both hermaphrodite or the lower male, all small, in small loose panicles with filiform spreading branches, the rhachis of the spikelet articulate above the empty glumes and not produced above the flowering ones. Glumes awnless, 2 outer empty ones equal, membranous, broadly lanceolate, faintly nerved. Flowering glumes close above the empty ones, equal, broad, truncate many-nerved, membranous. Palea several-nerved but 2 of the nerves very prominent. Styles distinct, with short stigmas. Fruiting glumes and palea enclosing the grain but not hardened.

The genus is limited to the Australian species, which is endemic. It has the small spikelets of *Isachne*, and only differs from that genus in the flowering glumes and paleas not hardened over the grain. It is also very nearly allied to *Airopsis* and the genera recently separated from it, which are however all annuals, with the habit of *Aira.*

1. **M. subulifolia,** *F. Muell. Fragm.* v. 208.—A glabrous prostrate or creeping perennial, with short ascending branches, covered at the base with the short broad closely imbricate sheaths of old leaves. Leaves in short dense tufts at the ends of the branches, linear-subulate, erect, under ½ in. long, the ligula split into cilia. Peduncles from the tufts erect, filiform, 1 to 2 in. long, encased at the base in 2 or 3 long narrow leaf-sheaths. Panicle broad and loose, ½ in. long or rather more, with capillary spreading slightly divided branches, Spikelets pedicellate, scarcely above ½ line long, usually dark-coloured, glabrous. Outer glumes as long as the flowering ones.

Queensland. Glasshouse Mountains, *W. Hill;* Rockingham Bay, on rocks, sometimes completely covering them in dense masses, *Dallachy*, also in *Leichhardt's* collection.

79. ISACHNE, R. Br.

Spikelets 2-flowered, both flowers hermaphrodite or the upper female or the lower male, small, in loose panicles, the rhachis of the spikelet articulate above the empty glumes, glabrous and not produced above the flowering ones. Glumes unawned, convex, faintly nerved, 2 outer empty ones nearly equal; flowering ones of a firmer consistence, closely sessile or the upper one slightly raised. Palea as long as the glume. Styles distinct. Grain enclosed in the hardened glume and palea, free from them.

A small tropical genus, common both to the New and the Old World. The Australian species have both a wide range in tropical Asia.

Leaves lanceolate. Spikelets glabrous or nearly so, nearly 1 line long	1. *I. australis.*
Leaves ovate, small. Spikelets hairy, about ½ line long.	2. *I. myosotis.*

1. **I. australis,** *R. Br. Prod.* 196.—Stems rather slender, decumbent, creeping and rooting at the lower nodes, ascending to 1 ft. or more. Leaves lanceolate, rough with a minute pubescence. Panicle loose, spreading, ovoid in circumscription, 1½ to 3 in. long, with numerous filiform branches. Spikelets all pedicellate, nearly 1 line long. Outer glumes quite glabrous. Lower flower usually male, with a glabrous glume, the upper female, shortly stipitate, with the glume usually minutely and slightly pubescent, the rhachis slightly dilated and articulate immediately under the upper glume.—*Panicum atrovirens*, Trin.; Kunth, Enum. i. 127; F. Muell. Fragm. viii. 193; *P. antipodum*, Spreng. Syst. i. 314.

Queensland. Moreton Bay, *F. Mueller.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls*, *Sieber*, *Agrostoth. n.* 68; New England, *C. Stuart.*

Victoria, Gillibrand, Broken, King, Goulburn, Hume and Snowy Rivers, *F. Mueller.*

Also in tropical Asia from Ceylon and the Peninsula to the Malayan Archipelago and South China.

2. **I. myosotis,** *Nees in Hook. Kew Journ.* ii. 98.—Stems slender, decumbent and branched at the base, short in the Australian specimens, extending to 1½ ft. in some others. Leaves ovate to ovate-lanceolate; small in the Australian specimens, above 1 in. long in some others, scabrous. with hairy sheaths and ciliate margins. Panicle ovoid and loose with slender spreading branches as in *I. australis* but smaller. Spikelets much smaller, rarely above ½ line long (not 1 line as given by a clerical error in Fl. Hongk.), the 2 outer glumes more or less pubescent or hirsute, and very much so in the Australian specimens; flowering glumes glabrous or nearly so, the upper flower female, the lower hermaphrodite.—Benth. Fl. Hongk. 415; *Panicum myosotis*, Steud. Syn. Glum. i. 96; F. Muell. Fragm. viii. 193.

N. S. Wales. Russell River, *W. Hill;* (two small specimens in herb. F. Mueller); also in the Malayan Archipelago and South China.

80. CŒLACHNE, R. Br.

Spikelets 2-flowered, the upper one usually female, the lower one hermaphrodite, all small in loose or narrow panicles, the rhachis of the spikelet glabrous, articulate, produced between the 2 flowering glumes, but not beyond them Glumes unawned, convex, 2 outer empty ones broad, faintly nerved, the 3rd or lowest flowering glume close above them and similar but larger. Terminal flowering glume raised on the slender rhachis, smaller than the 3rd. Paleas as long as the glume.

Styles short, distinct, with short stigmas. Fruiting glumes and paleas scarcely hardened, not closed over the grain.

A small genus, spread over tropical Asia, the only Australian species extending to the Malayan Peninsula and closely allied to a common Indian one.

1. **C. pulchella,** *R. Br. Prod.* 187.—A weak slender decumbent glabrous grass, rarely ascending to 6 in. Leaves flat, lanceolate or almost linear, flaccid but strongly nerved, under 1 in. long. Panicle narrow but loose, 1 to 3 in. long, the rhachis and short spreading branches filiform. Spikelets mostly pedicellate, scarcely ¾ line long. Outer empty glumes almost orbicular, faintly 3-nerved, the 3rd or lowest flowering glume twice as long as the outer ones, and close above them; rhachis between the flowering glumes as long as the outer glumes. Anthers small. Grain small and narrow.—Kunth, Rev. Gram. t. 143.

Queensland. Endeavour River, *Banks and Solander*, *A. Cunningham*.

Also in Tavoy, *Griffith*, *Wall. Cat. Herb. Ind. n.* 8909 (partly). The common Indian plant referred to this species in the Fl. Hongk. and in Thwaites Enum. Pl. Zeyl. differs in the erect virgate almost spikelike panicle, the spikelets rather longer, almost imbricate on the short erect branches, and is distinguished by Munro as *Cœlachne brachiata*, Munro (*Isachne simpliciuscula*, W. et Arn., *Panicum brachyglume* and *P. simpliciusculum*, Steud. Syn. Glum. i. 95, 96.)

81. ERIACHNE, R. Br.

Spikelets 2-flowered, usually not very numerous, in a loose or dense panicle, the flowers both hermaphrodite and similar, the rhachis of the spikelet articulate above the outer glumes and hairy round the flowering ones. Empty glumes 2, persistent, acute or tapering into a point or short awn, many (usually 9- to 11-) nerved. Flowering glumes with fewer nerves, with long spreading hairs on the back or margins, awnless or tapering into a fine straight or curved awn not twisted. Palea very flat, often hairy on the back, with 2 prominent almost marginal nerves. Styles distinct, short. Grain more or less flattened, enclosed in the glume and palea, free from them.

Besides the Australian species, which are mostly endemic, there are several in South Africa, and two or three in tropical Asia, of which one or perhaps two appear to be the same as Australian ones.

Awns much longer than the glumes. Panicle dense.
Spikelets sessile or nearly so.
Palea produced into 2 fine awn-like points.
Outer glumes glabrous, nearly 4 lines long. Awn
above 1 in. long . . . . 1. *E. stipacea.*
Outer glumes hairy, 2 to 2½ lines long. Awn
scarcely 1 in. . . . . 2. *E. Armittii.*
Palea-point short, entire or minutely notched.
Nodes densely bearded. Outer glumes hairy, nearly
4 lines long. Awn about 1 in. . . . . 3. *E. squarrosa.*
Nodes glabrous. Outer glumes hairy, about 2 lines
long. Awn under ½ in. . . . . 4. *E. glauca.*
Awns much longer than the glumes. Panicle loose, with
few pedicellate spikelets. Leaves narrow, hispid
with spreading hairs.

Outer glumes glabrous, 2½ to 3 lines long . . . . . . 5. *E. rara.*
Outer glumes hispid, 1½ lines long . . . . 6. *E. agrostidea.*
Awns not longer than the glumes. Panicle loose. Spikelets pedicellate, usually few.
Leaves narrow, hispid with spreading hairs. Small slender plants.
Outer glumes 1½ lines, glabrous . . . . 7. *E. ciliata.*
Outer glumes 2 to 2½ lines, shortly hairy . . . . 8. *E. setacea.*
Leaves glabrous.
Leaves subulate. Outer glumes glabrous, about 4 lines long. Flowering glumes ciliate only . . 9. *E. avenacea.*
Leaves flat. Outer glumes hairy, about 4 lines long. Flowering glume hairy all over . . . . 10. *E. aristidea.*
Leaves narrow. Outer glumes glabrous, scarcely 1½ lines long. Panicle very loose, with long branches and pedicels . . . . 11. *E. pallescens.*
Panicle narrow, rather more dense. Outer glumes glabrous, about 3 lines long . . . . 12. *E. festucacea.*
Awn none or reduced to a very small point.
Panicle dense ovate or oblong. Spikelets very shortly pedicellate. Outer glumes 3 to 4 lines long. Western species . . . . 13. *E. ovata.*
Panicle narrow. Spikelets pedicellate. Outer glumes about 3 lines long.
Low plant, with filiform hispid leaves. . . . . . . 14. *E. melicacea.*
Tall plant, with glabrous flat leaves . . . . 15. *E. pallida.*
Panicle loose or reduced to 2 or 3 spikelets. Outer glumes not above 2 lines long.
Leaves short, spreading, pungent-pointed, the sheaths covering the short branching stems . . 16. *E. scleranthoides.*
Leaves not pungent, the upper ones distant. Spikelets about 2 lines long.
Flowering glumes mucronate . . . . 17. *E. mucronata.*
Flowering glumes obtuse or scarcely acute . . . 18. *E. obtusa.*
Leaves very fine, hirsute. Small plant.
Spikelets Agrostis-like, about 1 line long . . . 19. *E. capillaris.*

1. **E. stipacea,** *F. Muell. Fragm.* v. 206.—Stems 2 or 3 ft. high, the nodes bearded, otherwise glabrous. Leaves narrow, flat. Panicle secund, rather dense, 4 to 5 in. long. Spikelets narrow, not numerous, nearly sessile along the branches. Outer glumes about 4 lines long, glabrous, tapering to a fine point and produced into a straight awn, sometimes nearly half as long as the glume. Flowering glumes shortly hairy all over, with a slender curved awn about 1½ in. long. Palea flat, tapering to a point divided into 2 awns nearly as long as the palea itself.

Queensland. Cape York, *Daemel.*

Var. *Schultziana.* Awns and points of the glumes rather but not much shorter. I can see no other difference.—*E. Schultziana,* F. Muell. Fragm. viii. 137.

N. Australia. Port Darwin, *Schultz, n.* 150, 183.

2. **E. Armittii,** *F. Muell. Herb.*—Stems 6 in. to 1 ft. high or rather more, the nodes slightly bearded. Leaves narrow, convolute.

Panicle dense, 1½ to 2 in. long, the rhachis slightly hirsute. Spikelets sessile on the short branches. Outer glumes 2 to 2½ lines long, more or less sprinkled with spreading hairs arising from tubercles, tapering into awn-like points shorter than the glume. Flowering glumes shorter, densely hairy all over, with a fine awn usually about 1 in. long. Palea tapering into 2 fine awn-like points a little shorter than the glume itself.

N. Australia. Gilbert River, *Armit;* Norman River, *Gulliver.*

3. **E. squarrosa,** *R. Br. Prod.* 183.—Stems erect, 2 ft. high or more, the nodes densely bearded with long silky hairs. Panicle dense, 2 to 4 in. long. Spikelets sessile and crowded along the short erect or slightly spreading branches. Outer glumes nearly 4 lines long, tapering to a fine point, hispid with long rigid spreading hairs. Flowering glumes nearly as long, narrow, hairy outside, tapering into an awn of about 1 in. Palea tapering into a short entire point.—*Aira squarrosa,* Spreng. Syst. i. 278.

N. Australia. Victoria River, *Elsey.*
Queensland. Endeavour River and Bustard Bay, *Banks and Solander.*

The Molucca plant, described and figured by Brongniart in Duperr. Voy. Bot. 24, t. 3, as *E. squarrosa,* Br., but with a 2-awned palea, would appear to me rather to represent the *E. Armittii.*

4. **E. glauca,** *R. Br. Prod.* 184.—Erect, 1 to 2 ft. high, glabrous and glaucous, the nodes not bearded. Leaves narrow, rather long. Panicle dense, 2 to 4 in. long. Spikelets sessile and crowded along the short erect or slightly spreading branches. Outer glumes about 2 lines long, more or less hairy outside, acute but not awned, faintly nerved. Flowering glumes about as long, sprinkled with hairs outside, the fine awn under ½ in. long. Palea tapering into an entire or slightly notched point.—Kunth, Rev. Gram. t. 64; *Aira lævis,* Spreng. Syst. i. 278.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* Victoria River, and Sturt's Creek, *F. Mueller.*

5. **E. rara,** *R. Br. Prod.* 183.—Stems slender, scarcely 1 ft. high, the nodes bearded. Leaves very narrow, crowded at the base of the stem, hispid with short spreading hairs. Panicle short, loose, rather secund. Spikelets few, on slender pedicels. Outer glumes acutely acuminate, 2½ to 3 lines long, glabrous and dark-coloured in the specimens seen, Flowering glumes shorter, hairy all over, tapering into a slender awn nearly 1 in. long. Palea tapering into a fine bifid point.—*Aira rara,* Spreng. Syst. i. 278.

Queensland. Shoalwater Bay, *R. Brown.*

6. **E. agrostidea,** *F. Muell. Fragm.* vii. 82.—A small tufted slender

annual, rarely 6 in. high. Leaves very narrow almost subulate, hispid with spreading rigid hairs. Panicle very loose, with erect capillary branches and pedicels. Spikelets few. Outer glumes 1¼ lines long, hispid with spreading hairs, tapering into short fine points. Flowering glumes nearly as long, ciliate with a few dorsal or marginal hairs, tapering into a capillary awn of a little more than ½ in. Palea shortly pointed. Stamens 2.

N. Australia. Port Darwin, *Schultz, n.* 143; north coast of Arnhem Land, *M'Kinlay.*

7. **E. ciliata,** *R. Br. Prod.* 184.—Slender decumbent and much branched, the stems ascending to 1 ft. in some specimens, under 6 in. in others. Leaves chiefly at the base, short, narrow, fine-pointed, spreading, more or less hirsute with rigid spreading hairs. Panicle loose, with capillary branches and pedicels. Spikelets few. Outer glumes nearly 1½ lines long, glabrous, thin, acute. Flowering glumes not longer, more acute, with a fine awn nearly as long as themselves, hirsute outside. Palea ciliate outside. Stamens 3. Grain much flattened.—*Aira ciliata,* Spreng. Syst. i. 278.

N. Australia. Arnhem Land, *R. Brown, M'Kinlay;* Port Darwin, *Schultz;* Escape Cliffs, *Hulse;* between Norman and Gilbert Rivers, *Gulliver.*

Queensland. Broad Sound, *R. Brown* (rather smaller, the panicle rather more dense).

8. **E. setacea,** *Benth.*—Stems under 1 ft. high, filiform, rigid, the nodes slightly bearded. Leaves also filiform and rigid, sprinkled with short rigid spreading hairs. Panicle loose, of very few pedicellate spikelets. Outer glumes very acute, 2 to 2½ lines long, shortly hirsute or nearly glabrous. Flowering glumes about as long, with a few hairs on the back near the base, the margins ciliate, tapering into an awn usually shorter than the glume itself. Palea tapering into a long entire or minutely notched point.

N. Australia. North Coast of Arnhem Land, *M'Kinlay.*

9. **E. avenacea,** *R. Br. Prod.* 184.—Stems usually about 1 ft. high, slender, the nodes slightly bearded or rarely glabrous. Leaves very fine, subulate, erect, chiefly at the base of the stem. Panicle loose, nearly simple or with few capillary branches bearing 2 or 4 pedicellate spikelets. Outer glumes usually about 3 lines long, very acute or shortly pointed, prominently nerved, glabrous. Flowering glumes glabrous on the back except at the base, the margins ciliate with long hairs, tapering into an awn much shorter than the glume itself. Palea slightly hairy, acutely acuminate.—*Aira avenacea,* Spreng. Syst. i. 278,

N. Australia. Cavern Island, *R. Brown;* Victoria River and M'Adam Range, *F. Mueller;* Port Darwin, *Schultz, n.* 350; Port Essington, *Armstrong.*

10. **E. aristidea,** *F. Muell. Fragm.* v. 205.—Stems branching and

often decumbent at the base, ascending to from ½ to 1½ ft., the nodes usually bearded. Leaves flat, glabrous, the sheaths often broad. Panicle loose, with few spreading branches. Spikelets shortly pedicellate. Outer glumes usually purplish, about 4 lines long, acute sprinkled with spreading hairs arising from tubercles. Flowerin glumes densely silky-hairy except at the top, tapering into an aw scarcely so long as the glume itself. Palea hairy, tapering into deeply bifid awnlike point.

Queensland. Bowen Downs, *Birch.*
Central Australia. Lake Eyre, *Andrews*; Charlotte Waters, *Giles.*
W. Australia. Murchison River, *Oldfield.*

11. **E. pallescens**, *R. Br. Prod.* 184.—Stems slender, branching, 1 t 2½ ft. high, the nodes glabrous. Leaves very narrow, glabrous or slightl ciliate at the base. Panicle very loose, with long capillary branches and pedicels. Spikelets scarcely 1½ lines long. Outer glumes glabrous acute. Flowering glumes hairy outside and ciliate, tapering into an awn nearly as long as the glume itself. Palea entire.—*Aira effusa,* Spreng. Syst, i. 278; *Eriachne chinensis*, Hance in Ann. Sc. Nat. ser. 4, xv. 228, and in Journ. Linn. Soc. xiii. 136.

Queensland. Endeavour River, *Banks and Solander*; Sandstone Ridges nea Rockhampton, *O'Shanesy.*

Also in the eastern provinces of India and in South China.

12. **E. festucacea**, *F. Muell. Fragm.* v. 205.—Erect, rather rigid, glabrous and glaucous, above 2 ft. high. Leaves convolute, with subulate points. Panicle narrow, not much branched, rather loose, 3 to 5 in. long. Spikelets pale-coloured. Outer glumes acute, glabrous, about 3 lines long. Flowering glumes longer, ciliate in the lower half and sprinkled on the back with a few hairs, tapering into a fine point or awn shorter than the glume itself. Palea entire, slightly hairy.

N. Australia. Careening Bay, N. W. Coast, *A. Cunningham*; Upper Victoria and Fitzmaurice Rivers, *F. Mueller.*

13. **E. ovata,** *Nees in Hook. Lond. Journ.* ii. 418.—Stems from a horizontal glabrous or woolly rhizome erect, rather rigid, 1 to 1½ ft. high; glabrous or nearly so in the typical form. Leaves chiefly at the base of the stem, very narrow, erect, with subulate points. Panicle dense, ovate or lanceolate, 1 to 2 in. long. Outer glumes acute, nearly 4 lines long, glabrous in the typical form. Flowering glumes as long or longer, pale-coloured, acutely acuminate but not awned, densely hirsute to above the middle with spreading hairs. Palea as long, shortly bifid, less hairy on the back.—*E. Preissiana,* Nees in Pl. Preiss. ii. 102.

W. Australia. Swan River, *Drummond,* 1*st coll. n.* 971, 972; Mount Brown, *Preiss, n.* 1838.

Var *villosa.* Leaf-sheaths and stems below the nodes densely villous with soft not spreading hairs. Panicle more dense, with more numerous and rather smaller spikelets.—W. Australia, *Drummond, n.* 168, 976 ; Champion Bay, *Oldfield.*

Var. *pallida.* Panicle rather longer and looser. Spikelets pale-coloured, smaller, the flowering glumes more pointed and longer in proportion.

Central Australia. Lake Eyre, *Andrews ;* Charlotte Waters, *Giles.*

Nees's descriptive articles on *E. ovata* and *E. Preissiana* are word for word the same, except that in the latter he has substituted spiculis "oblongis" for "ovatis."

14. **E. melicacea,** *F. Muell. Fragm.* v. 205.—A low tufted species, perhaps annual, 6 to 8 in. high. Leaves very narrow, with subulate points, often as long as the stem, sprinkled with short spreading hairs arising from tubercles. Panicle or raceme of very few (usually 3 to 6) pale-coloured pedicellate spikelets. Outer glumes glabrous, acute, rather rigid, about 3 lines long. Flowering glumes not exceeding them, the margins densely ciliate with long spreading hairs, the back as well as the palea glabrous except at the base or sprinkled with very few hairs.

N. Australia. Upper Victoria River, *F. Mueller.*

15. **E. pallida,** *F. Muell. Herb.*—Stems apparently about 2 ft. high, slender and branching. Leaves flat but narrow, with subulate points, glabrous. Panicle loose but narrow, 2 to 4 in. long, the spikelets all pedicellate. Outer glumes glabrous, about 3 lines long, tapering into fine points. Flowering glumes longer, with fine points, but scarcely awned, glabrous on the back except near the base, the margins ciliate with long hairs. Palea hairy, tapering to a fine bifid point.

N. Australia. Dampier's Archipelago, *Walcot.*

16. **E. scleranthoides,** *F. Muell. Fragm.* viii. 238.—The typical plant a small much-branched procumbent rigid perennial, the flowering branches ascending to 1 or 2 in., the barren ones twice as high, all covered with the closely appressed leaf-sheaths. Leaves spreading, subulate, rigid and pungent-pointed, ½ to ¾ in. long. Panicle reduced to a short raceme of 3 to 6 spikelets or sometimes only 1 or 2 close above the leaves. Outer glumes under 2 lines long, usually dark-coloured, rather broad, glabrous. Flowering glumes similar but thinner and paler coloured, acute or with short fine points not produced into awns, hirsute on the back with long white spreading hairs. Palea as long, hairy or ciliate.

Central Australia. Mount Olga, *Giles* ; between Youldeh and Ouldabrima, *Young.*

Var. *elongata.* Stems nearly 1 ft. high. Leaves ¼ to 1 in. long, but very spreading and pungent-pointed as in the typical form. Panicle pedunculate, with 6 to 12 spikelets.—M'Donnell Ranges, *Giles.*

17. **E. mucronata**, *R. Br. Prod.* 184.—Stems very slender but rigid, about 1 ft. high. Leaves short, spreading, subulate, with fine points, but not so pungent as in *E. scleranthoides*, the lower sheaths sprinkled with rigid hairs or glabrous, the upper ones distant. Panicle rather loose, 1 to 1½ in. long, of few spikelets closely resembling those of *E. obtusa*, but rather larger, and the flowering glumes tipped with short points exceeding the outer glumes.—*E. brevifolia*, R. Br. l. c.; *Aira mucronata*, Spreng. Syst. i. 276.

Queensland. Endeavour River, *Banks and Solander*; Dunrobin, Rosewood and other localities near Rockhampton, *O'Shanesy*, *Thozet.*

18. **E. obtusa**, *R. Br. Prod.* 184.—A variable grass, usually 1 to 2 ft. high, often branched in the lower part. Leaves narrow, flat or subulate, glabrous or the lower sheaths sprinkled with rigid hairs. Panicle loose, sometimes much-branched and 4 in. long, sometimes almost reduced to a raceme of half-a-dozen spikelets. Spikelets ovoid, about 2 lines long, appearing acute when young, assuming the obtuse aspect when in fruit. Outer glumes membranous, acute, with fewer nerves than most species (usually 5), sprinkled on the back and ciliate with a few long hairs, rarely quite glabrous. Flowering glumes about as long, more obtuse, rarely with a minute point, densely ciliate to the top and sprinkled on the back with spreading hairs. Palea entire, slightly hairy. Grain much flattened.

N. Australia. Islands of the Gulf of Carpentaria, *R Brown*, *Henne*; Upper Victoria River and Sea Range, *F. Mueller*; Cambridge Gulf and Cygnet Bay, N. W. Coast, *A. Cunningham*; Port Darwin, *Schultz*, *n.* 800; in the interior, *M'Douall Stuart*; Dampier's Archipelago (with smaller spikelets), *Walcot.*

Queensland. Endeavour River, *A. Cunningham*; King's Creek, *Bowman*; Springsure, *Wuth.*

N. S. Wales. Mount Cunningham in the interior, *A. Cunningham*; between the Darling and Cooper's Creek, *Neilson*, *Victoria Expedition.*

19. **E. capillaris**, *R. Br. Prod.* 184.—A slender annual of 6 to 10 in. Leaves short and fine, hirsute. Panicle very loose, 1 to 2 in. long, with long capillary branches and few small dark Agrostis-like spikelets on long pedicels. Outer glumes scarcely 1 line long, rather acute, thinly membranous, glabrous. Flowering glumes scarcely exceeding them, acute but unawned, hairy all over but not densely so. Palea as long as the glume, entire, hairy.—Kunth, Rev. Gram. t. 63; *Aira hispida*, Spreng. Syst. i. 276.

N. Australia. Arnhem Land, N. Coast, *R. Brown.*

SUBTRIBE IV. FESTUCACEÆ.—Spikelets with several often many flowers, rarely reduced to 2, in a loose and spreading or narrow and dense panicle rarely capitate, the rhachis of the spikelet articulate or continuous, usually produced above the flowers or bearing 1 or more terminal empty glumes. Outer glumes usually narrow, keeled, acute or obtuse. Flowering glumes usually broader, entire or notched at the end, obtuse or the keel or midrib produced into a point or straight awn. Palea usually as long as the glume or nearly so. Grain free within the glume and palea, or adnate to the palea.

82. ECTROSIA, R. Br.

Spikelets with 1 or rarely 2 fertile flowers and 2 or more male flowers or empty glumes above them, in a terminal panicle, the rhachis of the spikelet articulate above the 2 outer glumes. Outer empty glumes unawned, the 2nd rarely with a short point; glume of the perfect flower with a prominent point or short awn, the upper glumes tapering into fine straight awns. Styles distinct. Grain enclosed in the thin or scarcely hardened glume and palea.

The genus is limited to Australia.

Panicle compact and dense, with short erect branches.
  Flowering glume 2 lines long, rather rigid, 3-nerved, entire, tapering into a short awn . . . . 1. *E. Schultzii.*
  Flowering glume 1 line long, thin, notched, with an awn nearly as long as itself . . . . 2. *E. leporina.*
Panicle slender, loose, the short branches spreading.
  Flowering glume about ½ line long, thin, notched, with a very short point . . . . 3. *E. agrostoides.*
  Flowering glume about 1 line long, 3-nerved, tapering into a short point; glumes of the fruiting spikelet squarrose . . . . 4. *E. Gulliveri.*

1. **E. Schultzii,** *Benth.*—A glabrous slender but rigid tufted grass, from under 1 ft. to 1½ ft. high. Leaves chiefly at the base, narrow, ending in subulate points. Panicle narrow and dense but more interrupted than in *E. leporina*, often turned to one side, 2 to 4 in. long. Spikelets not so crowded and longer, with few hairs on the pedicels. Outer glumes scarcely 1 line long, thin and narrow. Lowest flowering glume rigid, lanceolate, distinctly 3-nerved, 1½ to 2 lines long, quite entire, tapering into a short awn, the next nearly similar but with a longer awn and the flower male only, the upper 2 or 3 glumes narrower and empty.

N. Australia. Between Maurice and Victoria Rivers, *F. Mueller;* Port Darwin, *Schultz, n.* 287.

2. **E. leporina,** *R. Br. Prod.* 186.—A glabrous slender grass attaining 2 ft. or more, but sometimes smaller. Leaves very narrow, ending in subulate points. Panicle narrow, dense, 3 to 6 in. long, the fine awns giving it much of the aspect of *Triraphis mollis.* Spikelets crowded along the short erect branches, often purplish, the very short pedicels often bearing a few long hairs. Outer glumes narrow, very acute, about 1 line long. Flowering glume nearly as long, narrow, hyaline, 1-nerved, slightly notched, with a fine awn nearly as long as

the glume. Terminal empty glumes usually 2 or 3, smaller than the flowering one but with longer fine awns.—Kunth, Revis. Gram. t. 69.

N. Australia. Coen River, Gulf of Carpentaria, *R. Brown;* Cleveland Bay *A. Cunningham;* Victoria River, *F. Mueller;* Port Essington, *Armstrong;* Port Darwin, *Schultz, n.* 281; between Norman and Gilbert Rivers, *Gulliver.*

Queensland. Cape York, *M'Gillivray, Daemel;* Endeavour River, *Banks and Solander;* Brisbane River, *F. Mueller;* Darling Downs, *Law.*

Var. *micrantha.* A smaller plant with setaceous leaves. Panicle looser, the spikelets much smaller approaching those of *E. agrostoides*, but rather crowded on the short erect branches as in the smaller specimens of *E. leporina.*—Victoria River, *F. Mueller*, between Norman and Gilbert Rivers, *Gulliver.*

E. spadicea, R. Br. Prod. 186, from Endeavour River, *Banks and Solander*, appears to me not to differ from the typical *E. leporina*, except in the rather smaller dense panicle.

3. **E. agrostoides,** *Benth.*—A slender tufted annual of 6 in. to 1 ft., with setaceous leaves. Panicle narrow but loose, 2 to 3 in. long, the rhachis and spreading branches filiform. Spikelets clustered on the shorter branches, distant on the longer ones. Glumes very narrow, about ½ line long, the flowering one shortly notched, with a very short point in the notch. Terminal empty ones 2 or 3, tapering into capillary awns of 1 to 1½ lines.

N. Australia. Port Essington, *Armstrong.*

W. Australia. A specimen in herb. Hook. marked as from *Drummond*, but there may be possibly some mistake

4. **E. Gulliveri,** *F. Muell. Fragm.* viii. 201.—A slender erect annual of 6 in. to 1 ft., with setaceous leaves. Panicle narrow but loose, with spreading branches ciliate as well as the very short pedicels with a few long hairs. Spikelets spreading or reflexed. Outer glumes membranous, very pointed, about 1 line long. Flowering glumes 1 or 2, at first very similar to the outer ones, but in the fruiting spikelet rigid, ovate, 3-nerved at the base, tapering into a fine very spreading point, giving the spikelet a squarrose aspect. Terminal empty glumes 2 to 4, with longer points or awns but rarely exceeding 1 line.

N. Australia. Between Norman and Gilbert Rivers, *Gulliver.* The spikelets have frequently as in the preceding species only 1 fertile flower but occasionally there are 2 fertile ones and a third male.

83. HETERACHNE, Benth.

Spikelets very flat, with 1 fertile flower and several empty glumes above it, nearly sessile and crowded in one or more globular heads, the rhachis of the spikelet articulate only under the perfect flower, very flexuose and continuous above it. Glumes complicate, keeled, rather obtuse, unawned, 2 outer empty ones persistent, the rest of the spikelet falling away with the fruit. Palea nearly as long as the flowering glume, folded, with 2 broad dorsal wings. Styles short, distinct. Grain oblique or curved, enclosed in the glume and palea but free from them.

The genus is limited to the two Australian species, which appear more nearly allied to *Ectrosia* and *Elytrophorus* than to *Eragrostis*, but singular in the whole spikelet with the exception of the outer glumes forming as it were an appendage to the grain.

Spikelets ovate, 2½ to 3½ lines long, with more than 6 upper empty glumes, in 1 or 2 heads, sessile in the leaf-sheaths or the upper one shortly pedunculate	1. *H. Brownii.*
Spikelets orbicular, scarcely 1½ lines diameter, with less than 6 upper empty glumes, in several globular small heads, forming a pedunculate interrupted spike	2. *H. Gulliveri.*

1. **H. Brownii,** *Benth.*—Stems 6 in. to 1 ft. high, rigid, simple or slightly branched, slender and almost filiform in a few specimens. Leaves convolute, narrow, with broad loose sheaths. Heads of spikelets few, sessile in the upper sheaths or the terminal one shortly pedunculate, very dense, about ½ in. diameter and ½ to 1 in. long. Spikelets nearly sessile, surrounded by a few loose hairs. Outer empty glumes persistent, rather smaller than the flowering ones. Deciduous part of the spikelet ovate, 2½ to 3½ lines long, the rhachis slightly hairy on the persistent part, glabrous above the articulation, very much recurved and incurved above the flowering glume and flexuose between the upper ones which vary in number from 6 to 14, all empty or with a small palea in the lower ones, narrow, about 1 line long, mostly without lateral nerves, the keel narrowly winged. Palea rather shorter than the glume, the wings broad, hyaline and shortly ciliate.—*Poa abortiva*, R. Br. Prod. 181.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown;* Carron Creek, *Herb. F. Mueller*, collector not named; Port Darwin, *Schultz*, *n.* 302 (a single apparently depauperate specimen in Herb. F. Mueller).

2. **H. Gulliveri,** *Benth. in Hook. Ic. Pl. t.* 1250.—Stems branching at the base and under 6 in. in the specimens seen. Leaves narrow. Heads of spikelets globular, 2 to 3 lines diameter, several sessile in a more or less interrupted pedunculate spike of 1 to 2 in., the rhachis of the head hairy between the spikelets, the general axis glabrous. Spikelets almost sessile, orbicular, scarcely above 1 line diameter, almost entirely occupied by the flowering glume and palea, which are broader than in *H. Brownii*, the glume 3-nerved, the keel winged and shortly ciliate at the end, the wings of the palea thin but not hyaline, shortly ciliate. Outer empty glumes smaller, unequal, the lowest 1-nerved, the 2nd 3-nerved but the keel not winged. Upper empty glumes 3 to 5, like the flowering one but narrower.

N. Australia. Between Norman and Gilbert Rivers, *Gulliver.* The deciduous part of the spikelets with the enclosed fruit have much of the aspect of those of *Courtoisia* in Cyperaceæ.

* 84. LAMARCKIA, Moench.

Fertile spikelets 1-flowered, intermixed with sterile ones in little clusters on the very short branches of an unilateral spikelike panicle, the rhachis of the spikelet glabrous inarticulate and produced above the flower, bearing a narrow empty awnlike glume and sometimes a 2nd rudimentary one above it. Outer empty glumes awnless, flowering one with a small dorsal awn. Sterile spikelets longer, with several truncate awnless empty glumes above the 2 outer acute ones.

The genus is limited to a single species, a native of the Mediterranean region, and perhaps not really naturalised in Australia. It only differs from *Cynosurus* in the fertile spikelets, containing only a single flower instead of 2 or more.

*1. **L. aurea,** *Moench; Kunth, Enum.* i. 389.—A very elegant small tufted annual, usually under 6 in. high, the one-sided dense panicle occupying nearly half the length. Outer glumes of the fertile spikelets 1¼ to 1½ lines long, rather unequal, keeled, with short fine points; flowering glume inserted higher up, broad and convolute round the flower, with a fine dorsal almost terminal awn 2 to 3 lines long. Sterile spikelets rather longer, the 2 outer glumes like those of the fertile one, with several empty ones above them, all broad, obtuse or truncate, elegantly distichous but not closely imbricate.—*Cynosurus aureus*, Linn.; Sibth. Fl. Gr. t. 79; *Chrysurus aureus*, Beauv.; Reichb. Ic. Fl. Germ. t. 58.

Admitted by F. Mueller, Fragm. viii. 116, as Australian on the authority of a small specimen from Swan Hill on the Murray River, and a fragment received from Tasmania, in both cases most probably accidentally introduced or cultivated.

85. PHRAGMITES, Trin.

Spikelets 3- or more-flowered, flat when open, all pedicellate in a large much-branched panicle, the rhachis of the spikelet elongated between the flowering glumes and covered with very long silky hairs enveloping the flowers. Glumes thin, keeled, the 2 outer ones empty, acute or shortly pointed, the 3rd like them but with a longer point and enclosing a male or rudimentary flower, the others more distant, with long almost awnlike points, the rhachis terminating in a rudimentary glume or bristle-like point. Palea 2-ribbed. Stigmas nearly sessile.

A small genus (or subgenus of *Arundo*) extending over the tropical and temperate and some colder regions of the New as well as the Old World, the Australian species being the common one over nearly the whole area, in wet ditches, marshes and shallow waters.

1. **P. communis,** *Trin.; Kunth, Enum.* i. 251.—A stout perennial usually 5 or 6 ft. high, but sometimes twice as much, with a long creeping rootstock and numerous long leaves often an inch broad, the sheaths covering the stems to the inflorescence. Panicle 6 in. to 1½ ft.

long, with numerous branches, more or less one-sided and drooping, often of a purplish brown tinge. Spikelets numerous, at first very narrow, 4 to 6 lines long, flat and spreading when in seed, the long silky hairs proceeding from the rhachis and as long as or longer than the glumes, giving the panicle a beautiful silvery aspect; the glumes themselves and the short part of the rhachis below the 3rd glume quite glabrous.—Hook. f. Fl. Tasm. ii. 118; Reichb. Ic. Fl. Germ. t. 108; *Arundo phragmites*, Linn.; R. Br. Prod. 183.

Queensland. Goold Island, *M'Gillivray*; Cape Grafton, *A. Cunningham*; Rockingham Bay, *Dallachy*, southern districts from numerous collectors.

N. S. Wales. Port Jackson, *R. Brown*; New England, *C. Stuart*; Clarence River, *Wilcox*; Murrumbidge, *Mrs. Calvert*; Lord Howe's Island, *Fullagar.*

Victoria. Melbourne to the western frontier, *Robertson*, *F. Mueller* and others.

Tasmania. Abundant in watery places throughout the island, *J. D. Hooker.*

S. Australia. Spencer's Gulf, *R. Brown*; St. Vincent's Gulf, *F. Mueller.*

I have seen no specimens from West Australia.

86. DISTICHLIS, Rafin.

Spikelets several-flowered, diœcious, shortly pedicellate in a narrow panicle often reduced to 2 or 3 spikelets, the rhachis glabrous, articulate between the flowering glumes, at least in the females. Outer empty glumes, narrow, keeled. Flowering glumes broader, keeled, many-nerved, all acute, unawned. Palea folded, the keels very prominent or narrowly winged. Stamens in the males 3, without any or with a small rudimentary ovary. Staminodia in the females very rare. Lodicules broad. Ovary glabrous, tapering into 2 rather long styles with exserted stigmas. Grain obovoid or elliptical, free, with a thick spongy pericarp.

The genus consists of a single maritime species of very wide range, chiefly American, with perhaps a second inland one also American. The Australian plant appears to be identical with the common American one.

1. **D. maritima,** *Rafin. in Journ. Phys.* lxxxix. 104.—A rigid glabrous much-branched grass, forming broad low leafy tufts, the branches sometimes growing out to 1 ft. covered to the inflorescence with the leaf-sheaths. Leaves narrow, rigid, very acute or pungent-pointed, usually distichously spreading. Spikelets few, 2 or 3 in the females, rather more in the males, 6 to 9 lines long in the Australian specimens, rather smaller and more numerous in some American ones, flat but rather thick, 8- to 12-flowered. Glumes closely imbricate, about 3 lines long, rather rigid and straw-coloured. Anthers in the males long. Stigmas in the females protruding from the end of the glumes.—*Uniola spicata*, Linn. Spec. Pl. 104; *Brizopyrum spicatum*, Hook. and Arn. Bot. Beech. 403; *Uniola distichophylla*, Labill. Pl. Nov. Holl. i. 21, t. 24; *Poa distichophylla*, R. Br. Prod. 182; *Festuca distichophylla*, Hook. f. Fl. Tasm. ii. 127; F. Muell. Fragm. viii. 129; *Poa paradoxa*, Rœm. and Schult. Syst. ii. 569; *Poa Michauxi*, Kunth, Enum. i. 325, Rev.

Gram. t. 181; *Poa thalassica*, Kunth, Enum. i. 326; Rev. Gram. t. 81, 82; *Distichlis thalassica* and *D. maritima*, E. Desv. in C. Gay, Fl. Chil. vi. 397, 398.

Victoria. Various points of the sea-coast, *F. Mueller* and others; near Skipton, *Whan*; Murray River, *Dallachy*; Hopkins River, *Sullivan*.

Tasmania. Port Dalrymple, *R. Brown*; common on the sea-coasts, *J. D. Hooker* and others.

S. Australia. St. Vincent's and Spencer's Gulfs, *F. Mueller* and others.

Some specimens from Kangaroo Island, *Henzenroeder*, in Herb. F. Muell., have short densely tufted barren branches covered with imbricate leaves with shortly spreading pungent laminæ of 3 or 4 lines. I have not seen the ripe grain, but some far advanced ovaries already show the thickened pericarp described by Kunth and by Emile Desvaux. The original generic character given by Rafinesque would have been quite insufficient for identification were it not for the specific synonyms he quotes.

87. ELYTROPHORUS, Beauv.

Spikelets small and flat, few-flowered, sessile, in dense compound globular clusters crowded in a cylindrical spike or the lower ones distant, the rhachis of the spikelet glabrous, articulate under the flowering glumes. Outer empty glumes narrow, membranous, keeled with short points. Flowering glumes 3-nerved, tapering into long points or short awns, 1 or 2 upper glumes empty or with male flowers. Palea folded, with 2 dorsal wings. Stamen 1. Styles free, distinct. Grain smooth, free.

The genus is limited to the single Australian species, widely spread over tropical Asia and Africa.

1. **E. articulatus**, *Beauv.*; *Kunth*, *Enum.* i. 391, *Rev. Gram. t.* 154.—An erect glabrous annual, from under 6 in. to rather above 1 ft. high including the inflorescence. Leaves flat, often longer than the stem, with loose sheaths. Spikelets small and very numerous, the globular clusters sessile in a cylindrical spike 3 to 4 lines diameter and often occupying the greater part of the plant, either continuous throughout or interrupted and shortly branched at the base. Glumes rarely 1 line long without the points, the awns of the flowering ones about as long as or rarely longer than the glume. Dorsal wings of the palea entire or denticulate, either both or one only rather broad.

N. Australia. Victoria River, *F. Mueller*; between Norman and Gilbert Rivers, *Gulliver*.

Queensland. Rockhampton and neighbouring districts, *O'Shanesy*, *Bowman*; Bowen Downs, *Birch*.

S. Australia. Murray River, *F. Mueller*; Charlotte Waters, Central Australia, *Giles*.

88. KŒLERIA, Pers.

Spikelets 2- or more-flowered, flat, shortly pedicellate, numerous in a dense spike-like cylindrical or interrupted panicle, the rhachis of the spikelet articulate between the flowering glumes, glabrous. Glumes keeled, acute or produced into short straight awns or points, 2 outer empty ones unequal and scarious on the margin only; flowering glumes similar but more scarious or hyaline, the upper ones gradually smaller, the lowest the largest and sessile within the empty ones, the uppermost one or two usually empty. Palea very thin, acutely 2-keeled, 2-toothed or 2-pointed. Styles very short. Grain enclosed in the glume and palea free from them.

A small genus ranging over the temperate regions of the northern hemisphere, more sparingly distributed in the southern and perhaps most frequently introduced. The Australian species are both common northern ones.

Perennial. Larger glumes acute, 2 to 3 lines long	1. *K. cristata.*
Annual. Larger glumes shortly awned, 1½ lines long . .	2. *K. phleoides.*

1. **K. cristata,** *Pers.; Kunth, Enum.* i. 381.—A perennial, the common northern form usually about 6 in. high with a dense tuft of short leaves and a cylindrical spike-like panicle of 1 to 2 in., the spikelets mostly 2- or 3-flowered, the Australian specimens belonging chiefly to a luxuriant form 1 to 2 ft. high. Leaves pubescent-ciliate. Spike-like panicle 3 to 6 in. long, interrupted at the base, very shining. Spikelets 4 to 5 lines long, with 5 to 7 flowers. Outer glumes 3 lines long, very thin, scarious on the edges, 3- or 5-nerved; flowering glumes more scarious, almost nerveless except the green keels, all acute but not awned.—Hook. f. Fl. Tasm. ii. 126; Reichb. Ic. Fl. Germ. t. 93.

N. S. Wales. North of Bathurst, *A. Cunningham* (large and luxuriant).
Victoria. Wimmera, *Curdie* (the small typical form).
Tasmania. Macquarrie Plains, *Gunn* (large and luxuriant).

The species ranges over the temperate and subtropical regions of the New and the Old World in the northern hemisphere, and in some parts of the southern.

2. **K. phleoides,** *Pers.; Kunth, Enum.* i. 383.—An erect tufted annual of 6 in. to 1 ft. usually glabrous except long cilia on the margins and orifice of the leaf-sheaths. Spikelike panicle ¾ to 2½ in. long, cylindrical or when large slightly branched. Spikelets about 2 lines long, with 5 to 7 flowers. Glumes very spreading, the larger ones 1½ lines long with a point or awn rarely above 1 line long, the outer empty ones unequal, the lowest small and acute, the 2nd shortly pointed and nearly as long as the flowering ones, the terminal empty glume or glumes usually broader, shorter and awnless.

N. S. Wales. Yass, *Mrs. Calvert;* Mudgee, *Taylor.*
S. Australia. Adelaide and Torrens River, *F. Mueller;* Swan Hill, *Gummon* (the latter with very short awns).

The species extends over the whole of the Mediterranean region from the Azores to Affghanistan, and may be introduced only into Australia.

* 89. DACTYLIS, Linn.

Spikelets several-flowered, sessile and densely crowded in thick one-sided clusters, arranged in a short irregular spike or at the ends of the short branches of a dense irregular one-sided panicle. Flowering glumes 3- or 5-nerved, the keel prominent and produced into a point or short awn. Grain free, concave or broadly furrowed.

The genus is limited to a single species common in Europe, temperate Asia and North Africa, and now naturalised in Australia as in some other countries.

* 1. **D. glomerata,** *Linn.; Kunth, Enum.* i. 386.—A coarse stiff grass of 1 to 2 ft., the perennial stock forming at length dense tufts. Clusters of spikelets dense and ovoid, sometimes collected into a close spike of about 1 in. sometimes in a broken spike of several inches or on the branches of a short, more or less spreading panicle. Each spikelet much flattened, 3- to 5-flowered. Flowering glumes lanceolate, 2 to 2½ lines long, ciliate on the back, outer glumes rather shorter, narrow, with a prominent ciliate keel.—Reichb. Ic. Fl. Germ. t. 59; F. Muell. Fragm. viii. 126.

Now naturalised in various localities in **N. S. Wales** and **Victoria,** *F. Mueller* and others.

90. CENTOTHECA, Desv.

Spikelets several- (usually 3-) flowered, flat, all pedicellate in a loose spreading panicle, the rhachis of the spikelet slender, inarticulate, glabrous. Glumes acute or minutely pointed, unawned, keeled, the lowest flowering glume close above the 2 outer empty ones and like them glabrous, the upper flowering ones bearing on the marginal nerves a few rigid bristles at first erect, at length reflexed. Palea 2-keeled. Ovary glabrous. Styles distinct, short. Grain oblong, not furrowed, free.

The genus is limited to the single Australian species, generally spread over tropical Asia and Africa.

1. **C. lappacea,** *Desv.; Kunth, Enum.* i. 366, *Revis. Gram. t.* 70. —An erect glabrous grass of many feet. Leaves flat, ½ to ¾ in. broad, the numerous parallel nerves very prominent; ligula short, ciliate or jagged. Panicle terminal, 8 to 10 in. long and as broad when open, the capillary branches slightly divided. Spikelets 3 to 4 lines long, green. Lowest empty glume a little more than 1 line, the 2nd 1½ lines long; flowering glumes a little larger, the rhachis produced into a short point beyond the uppermost one, or bearing a small terminal empty

glume. Flowers within the glumes often distinctly stipitate with the palea inserted on the stipes.—Beauv. Agrost. t. 14, f. 7.

Queensland. Daintree River, *Fitzalan;* Johnston River, *Gulliver.*

Var. *biflora.* Spikelets smaller with only 2 flowering glumes, the lowest glabrous like the outer ones, the upper one alone setiferous.—Rockingham Bay, *Dallachy.*

91. ERAGROSTIS, Beauv.

Spikelets several- usually many-flowered, pedicellate or sessile in a loose and spreading or narrow and clustered panicle, the rhachis of the spikelet usually glabrous and articulate under the flowering glumes, but often very tardily so and sometimes inarticulate. Outer empty glumes unequal and rather shorter than the flowering ones, keeled, without any or only faint lateral nerves. Flowering glumes obtuse or acute, unawned, 3-nerved, the keel prominent, the lateral nerves in a few species very faint. Palea shorter than the glume, with 2 prominent nerves or keels, often persisting after the glume and grain have fallen away. Grain free, ovoid or oblong, not furrowed.

The genus is as widely spread as *Poa* in warm and temperate regions, but disappears in cold countries and high mountains. Of the nineteen Australian species five at least are common East Indian ones, one of them abundant also beyond the tropics in the Old World, one is also in New Zealand, the remaining thirteen have not yet been absolutely identified with extra Australian species, although some of them as observed by Munro are very closely connected if not identical with South African or American species. The limits to be assigned however to some of the variable ones are as yet very uncertain, and in F. Mueller's collections there are two or three more which may prove to be distinct species but of which the specimens are scarcely sufficient for identification.

Sect. I. **Chaunostachya.**—*Spikelets somewhat flattened, the glumes rather distant, loosely imbricate, overlapping the rhachis at the base so as not to leave a longitudinal furrow, usually very thin with the lateral nerve on each side faint or marginal.*

The first three species have the few-flowered spikelets with the rhachis very readily disarticulating of *Poa*, but always only one instead of two nerves on each side of the keel of the flowering glumes.

Spikelets usually 3- or 4-flowered, pedicellate, in a spreading panicle.
Spikelets very numerous and minute, ⅓ to ⅔ line long.
Grain ovoid, smooth . . . . 1. *E. tenella.*
Spikelets on long capillary pedicels, 1 to 2 lines long.
Grain globular, tuberculate . . . . 2. *E. nigra.*
Spikelets few, shortly pedicellate. in a loose panicle, 1 to 2 lines long. Grain ovoid, smooth . . . 3. *E. imbecilla.*
Spikelets linear, more than 6-flowered.
Glumes very obtuse truncate or emarginate. Spikelets numerous, in a loose panicle . . . . . 4. *E. trichophylla.*
Glumes acute or rarely almost obtuse.
Spikelets numerous, pale-coloured, shining, shortly pedicellate and crowded on the long branches of a narrow panicle.

Grain oblong-linear . . . . 5. *E. leptocarpa.*
Grain broadly obovoid . . . . 6. *E. megalosperma.*
Spikelets numerous, very narrow linear, shortly pedicellate and distant along the capillary erect branches of the panicle . . . . . 7. *E. pilosa.*
Spikelets not very numerous, linear-lanceolate, pedicellate, in a spreading panicle . . . . 8. *E. leptostachya.*

Sect. II. **Megastachya.**—*Spikelets when mature very flat. Glumes closely imbricate in 2 distinct rows, leaving a longitudinal furrow or depression between them on each side of the spikelet, the lateral nerve usually prominent in the middle of each side of the glume.*

Base of the stems glabrous, not at all or scarcely thickened.
Spikelets narrow, about 3 lines long, crowded secund and spreading or reflexed on the short clustered branches of a simple panicle. Glumes very acute . . . . 9. *E. Schultzii.*
Spikelets under 3 lines, sessile in small dense globular or oblong clusters sessile along a simple rhachis. Stamens usually 2 . . . . 10. *E. diandra.*
Spikelets 3 to 6 lines, rather narrow, usually sessile and erect, scattered or clustered, rarely shortly pedicellate and spreading, in a simple or branched panicle. Stamens usually 3 . . . . 11. *E. Brownii.*
Spikelets 3 to 6 lines long, broad sessile and crowded on a short almost simple rhachis. Palea-keels ciliate with long rigid hairs. . . . . 12. *E. concinna.*
Spikelets narrow, clustered along the long erect branches of a narrow panicle. Palea narrow, truncate, glabrous, not above ⅓ as long as the glume . . . . 13. *E. speciosa.*
Base of the stem and short sheath of radical leaves thickened into an almost bulbous woolly-hairy base.
Spikelets shortly pedicellate, nearly 2 lines broad, the base of the flowering glumes woolly-hairy . . 14. *E. laniflora.*
Spikelets sessile, scattered, glabrous, above 1 line broad . . . . 15. *E. eriopoda.*
Spikelets shortly pedicellate, glabrous, about ¾ line broad . . . . 16. *E. chætophylla.*

Sect. III. **Cylindrostachya.**—*Spikelets very narrow, terete or nearly so. Glumes closely appressed.*

Spikelets 10- to 30-flowered, rather obtuse, shortly pedicellate in a small panicle . . . . 17. *E. lacunaria.*
Spikelets 12- to 50-flowered, obtuse, sessile, usually clustered, often incurved . . . . 18. *E. falcata.*
Spikelets 8- to 10-flowered, rather acute, nearly sessile, divaricate, on the spreading branches of the panicle 19. *E. stenostachya.*

Poa porrantha, Steud. Syn. Glum. i. 262, from Port Jackson, *D'Urville*, is described as having the flowering glumes with only one nerve on each side, and would therefore be an *Eragrostis*, but his character is insufficient for identification. *Eragrostis eximia*, Steud. l. c., from New Holland and New Zealand, with a 5-nerved flowering glume, is certainly no *Eragrostis*, but cannot be determined without seeing a specimen.

SECT. I. CHAUNOSTACHYA.—Spikelets narrow or very small, somewhat flattened, the glumes rather distant, loosely imbricate, overlapping the rhachis at the base so as not to leave the longitudinal furrow of *Megastachya*, usually very thin or hyaline, the lateral nerve on each side usually faint or marginal, the rhachis often as readily disarticulating as in *Poa*, the palea rarely persistent after the fall of the grain.

1. **E. tenella**, *Beauv.; Benth. Fl. Hongk.* 431.—An erect tufted annual, from 6 in. to near 2 ft. high. Leaves flat, usually narrow, glabrous. Panicle usually occupying the greater part of the plant, with very numerous capillary much divided branches, the lower ones in distant whorls or clusters. Spikelets pedicellate, minute, rarely ¾ line long, with 3 or 4 or rarely 6 flowers. Glumes thin, almost hyaline, obtuse, about ½ line long, the lateral nerve on each side almost marginal, very loosely imbricate, the rhachis articulate. Palea glabrous, as long as the glume. Stamens varying 1 to 3. Grain very small, ovoid.—*Poa tenella*, Linn.; R. Br. Prod. 181.

N. Australia. Upper Victoria and Fitzmaurice River, *F. Mueller;* Gulf of Carpentaria, *Landsborough, Gulliver.*

Queensland. Broad Sound, *R. Brown;* Port Denison, *Fitzallan;* Rockhampton and neighbouring districts, *Thozet, Bowman, O'Shanesy;* Kennedy district, *Daintree;* Mitchell district, *Birch.*

Victoria. King River, *F. Mueller.*

Central Australia. Macdonnell Range and Charlotte Waters, *Giles;* Stephenson River, *M'Douall Stuart.*

Widely spread in eastern tropical Asia.

The confusion between this species and *E. plumosa*, Link (*P. amabilis*, Linn.) was cleared up by Munro in Journ. Linn. Soc. vi. 43, and the result given in Fl. Hongk. as above quoted. Kunth's figure of *P. tenella*, Rev. Gram. t. 147, represents the *E. plumosa.*

2. **E. nigra**, *Nees in Steud. Syn. Glum.* 267, var. *trachycarpa.*—Leaves only seen in one specimen, narrow, rather short, glabrous. Panicle 1 ft. long or more, very loose, with very long capillary divided branches, bearing few small dark-coloured spikelets on long capillary pedicels, the spikelets ovate, 1 to 2 lines long, loosely 2- to 4-flowered, quite glabrous. Flowering glumes broad, obtuse or scarcely acute, hyaline, the lateral nerves scarcely conspicuous. Palea as long, usually broad. Stamens 3, with small anthers. Grain large in proportion, globular, prominently rugose-tuberculate.

N. S. Wales. New England, *C. Stuart;* Armidale, *Perrott.* It is on the authority of Munro that I have referred this to the East Indian *E. nigra*, from which our specimens differ slightly in the longer pedicels and more prominently rugose grain.

3. **E. imbecilla**, *Benth.*—Stems tufted and branched at the base, weak and filiform, ascending to from 6 in. to 1 ft. Leaves very narrow, spreading. Panicle loose and slender, with few distant branches mostly undivided. Spikelets few, pedicellate, 1½ to 2 lines long, rather loosely

4- to 6-flowered, glabrous. Flowering glumes scarcely above ½ line long, hyaline, the lateral nerves almost or quite marginal. Palea curved, sometimes persistent, but usually falling off with the glume on the rhachis disarticulating.—*Poa imbecilla*, Forst. (name only); Spreng. Mant. i. Fl. Hal. 33; Hook. f. Handb. N. Zel. Fl. 337, but not of R. Br.; *P. Sprengelii*, Kunth, Enum. i. 363, wrongly referred by Steudel to *P. implexa*, Trin.

Queensland. Herbert's Creek, *Bowman*. I cannot distinguish these specimens from those described by Hooker from New Zealand. Forster's plant is only known from Sprengel's imperfect character; which however as far as it goes agrees fairly with our plant, except that he says the leaves are very long.

4. **E. trichophylla,** *Benth.*—Stems densely tufted, about 1 ft. high, slender. Leaves very narrow, the sheaths sprinkled with long fine spreading hairs. Panicle loose, spreading, 3 to 4 in. long, with numerous scattered divided capillary branches. Spikelets on filiform pedicels, very narrow, slightly compressed, 2 to 4 lines long, loosely 8- to 12-flowered, the rhachis articulate. Glumes rather distant, closely appressed, ½ to ¾ line long, broad, very obtuse truncate or emarginate, thin and shining, the lateral nerves prominent. Palea nearly as long, glabrous. Stamens 2 or 3. Grain small but not seen ripe.

S. Australia. North of Fowler's Bay, *Giles*. This species appears to connect the sections *Chaunostachya* and *Cylindrostachya*.

5. **E. leptocarpa,** *Benth.*—An elegant slender grass, from under 1 ft. to 2 ft. high, with much of the habit, the flat leaves, and inflorescence of *E. tenella*. Panicle at first narrow, at length spreading with numerous much divided capillary branches, the lower ones often clustered and in the larger specimens 6 in. long and the whole panicle 9 or 10 in., in other specimens much smaller. Spikelets narrow-linear, 2 to 3 lines long, loosely 6- to 12-flowered, pale-coloured and shining, glabrous. Glumes very narrow, rather acute, ¾ line long, thin and hyaline, the lateral nerves not very conspicuous. Palea nearly as long. Stamens usually 2, anthers very small. Grain oblong-linear, sometimes very narrow and as long as the glume, in other specimens shorter.

Queensland. Mitchell District, *Birch*.
Central Australia. Charlotte Waters, *Giles*.

6. **E. megalosperma,** *F. Muell. Herb.*—Stems 2 to 3 ft. high, the branches almost filiform but often rigid and clustered. Leaves long and narrow, flat or convolute, glabrous. Panicle narrow and compact, 3 to 8 in. long, with erect branches. Spikelets sessile or shortly pedicellate, erect, crowded, linear, about 3 lines long when fully out, rather silvery-shining, loosely 6- to 8-flowered, the rhachis glabrous, scarcely articulate. Flowering glumes about 1 line long, acute, the lateral nerves often scarcely conspicuous except at the base. Palea nearly as long, scarcely curved. Stamens usually 2, oblong. Grain

broadly ovoid, often ¾ as long as the glume, readily falling away leaving the glume and palea more persistent.

Queensland. Rockhampton, *O'Shanesy; Gwydir River*, *Leichhardt*.

7. **E. pilosa,** *Beauv. Agrost.* 71.—A tufted erect or ascending annual, 1 to near 2 ft. high. Leaves narrow, usually flat. Panicle 6 in. to 1 ft. long, narrow at first, spreading when in fruit, with numerous long capillary divided branches. Spikelets 2 to 4 lines long, narrow linear, usually of a dark leaden colour but pale when old, loosely 6- to 20-flowered, the rhachis scarcely articulate. Glumes thin, distinctly keeled, the lateral nerves faint and short. Palea nearly as long, slightly ciliate on the keels, often persistent after the glumes have fallen away. Grain ovoid-oblong, smooth.—*Poa pilosa*, Linn.; Kunth, Enum. i. 329; *P. verticillata*, Cav. Ic. i. 63, t. 93; *P. parviflora* and *P. pellucida*, R. Br. Prod. 180, 181; *E. parviflora*, Trin. in Mem. Acad. Petersb. 1831, 411; *E. pellucida*, Steud. Syn. Glum. 279; *P. tenella*, Sieb. Agrostoth. n. 79, not of Linn.

Queensland. Broad Sound, *R. Brown; Kennedy District*, *Daintree*; Rockhampton and neighbouring districts, *Bowman*, *Thozet*, *O'Shanesy*; Brisbane River, *Bailey* and others.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls* and many others; New England, *C. Stuart*; Clarence River, *Wilcox*.

Victoria. Ovens and Murray Rivers, *F. Mueller*; Portland, *Allitt*.

A common weed in the warmer and some temperate regions of the northern hemisphere, chiefly in the Old World. The hairs at the base of the branches of the panicle, which originally gave rise to the specific name, are not observable in any of the Australian specimens and not constant in European ones.

8. **E. leptostachya,** *Steud. Syn. Glum.* i. 279.—Stems slender, usually about 1 ft. high. Leaves at the base narrow, convolute or setaceous, glabrous. Panicle loosely pyramidal, 3 to 5 in. long, with slender divided spreading branches. Spikelets on ~~capillary pedicels~~ of 1 to 3 lines, loosely spreading, about 2 lines long, narrow, but much broader than in *E. pilosa*, much smaller than in *E. Brownii*, loosely 6- to 10-flowered, usually dark-coloured. Glumes acute, more spreading than in *E. pilosa*, the lateral nerves faint and almost marginal. Palea nearly as long, glabrous. Grain ovoid, smooth.—*Poa leptostachya*, R. Br. Prod. 180.

Queensland. Brisbane River, *Bailey*; King's Creek, *Bowman*.

N. S. Wales. Port Jackson, *R. Brown*, *Woolls*; New England, *C. Stuart*; Illawarra, *Johnson*; Macleay River, *Beckler*.

The species appears to be intermediate between *E. pilosa* and *E. Brownii*, var. *patens*, but distinct from both.

SECT. II. MEGASTACHYA.—Spikelets when mature very flat, the glumes usually numerous, closely imbricate in two distinct rows, leaving a longitudinal depression or furrow on each face of the spikelet, the lateral nerve usually prominent about the middle of the side, the rhachis less readily disarticulating than in *Chaunostachya* and the palea very frequently persisting after the glume and grain have fallen away.

9. **E. Schultzii,** *Benth.*—Stems rather rigid, 3 ft. high or more. Leaves as long, flat, the larger ones 2 to 3 lines broad, quite glabrous. Panicle narrow, 6 to 8 in. long, with short spreading branches, the lower ones in distant clusters, the upper ones scattered. Spikelets crowded and clustered along the branches from their base, all turned to the lower side, and very spreading or reflexed, sessile or very shortly pedicellate, flat when full grown, 2 to 3 lines long, 8- to 12-flowered. Glumes closely distichous, acutely keeled and acute, the lateral nerve prominent on each side. Palea nearly as long. Stamens 3. Grain very small, ovoid.

N. Australia. Port Darwin, *Schultz, n.* 81.

10. **E. diandra,** *Steud. Syn. Glum.* i. 279.—Stems 1 to 2 ft. high. Leaves very narrow, often convolute, glabrous. Panicle usually contracted into an interrupted spike of 3 to 6 in. Spikelets very numerous, rarely above 2 lines long, flat, scarcely 1 line broad, 6- to 12-flowered, sessile in dense sessile clusters, the upper ones forming a cylindrical spike 3 or 4 lines diameter, the lower clusters usually distant, the lowest oblong or forming a cylindrical sessile spike of ½ in. or more. Flowering glumes closely distichous, thin, rather obtuse, the lateral nerves in the centre of each side or near the margin. Rhachis tardily or not at all articulate. Palea nearly as long as the glume, incurved. Stamens 2 with small anthers in the flowers examined but perhaps sometimes 3. Grain ovoid.—*Poa diandra*, R. Br. Prod. 180; *P. interrupta*, Sieb. Agrostoth. n. 74.

N. Australia. Upper Victoria River and Sturt's Creek, *F. Mueller.*

Queensland. Keppel and Shoalwater Bays, *R. Brown*; northern districts, *Gulliver*, *Armit*; Rockhampton and southern districts, *Thozet*, *Bowman*, *Leichhardt*, *Bailey* and others.

N. S. Wales. Port Jackson, *R. Brown*; New England, *C. Stuart*; Clarence River, *Wilcox*, *Beckler.*

S. Australia. Tamunda, *F. Mueller.*

W. Australia. *Drummond, n.* 170; Blackwood River, *Waloot*, *Forrest.*

In the case of some specimens it is difficult to decide whether they should be referred to this species or to an extreme form of *E. Brownii*, though generally the two appear very distinct. The number of stamens, 2 in *E. diandra*, 3 in *E. Brownii*, is not I believe constant.

11. **E. Brownii,** *Nees in Steud. Syn. Glum.* i. 279.—A very variable plant in stature and aspect, usually above 1 ft. high, with very narrow flat or convolute leaves, glabrous except a few cilia at the orifice of the sheaths not by any means constant. Panicle sometimes simple and dense, a few inches long, almost spikelike with numerous small densely clustered spikelets, always however longer and more acute than in *E. diandra*, sometimes with short spreading branches and few spikelets, sometimes a foot long with few distant branches and long spikelets singly scattered or in distinct clusters, and a great variety of intermediate forms. Spikelets always sessile or very nearly so, flat, varying from ¼ to ½ in. long, with 10 to 40 flowers, the rhachis very tardily articulate. Flowering glumes closely distichous, the lateral nerve

nearly central on each side and prominent. Palea shorter than the glume, incurved, the keels usually minutely ciliate. Stamens usually 3, but sometimes only 2 even in the larger spikelets. Grain ovoid-oblong, smooth.—*Poa polymorpha*, R. Br. Prod. 180; *Megastachya polymorpha*, Beauv. Agrost. 74; *Poa Brownii*, Kunth, Enum. i. 333.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*, *Henne*; Victoria River and Sturt's Creek, *F. Mueller*; Dampier's Archipelago, *Walcot*; Port Essington, *Armstrong*; Port Darwin, *Schultz*, *n.* 210, 312, 453. These northern specimens chiefly with rather large scattered or slightly clustered spikelets, and have sometimes the leaf-sheaths slightly hairy, which constitutes the *Poa pubescens*, R. Br. Prod. 181; *Eragrostis pubescens*, Steud. Syn. Glum. i. 279.

Queensland. Prince of Wales Islands and Keppel Bay, *R. Brown*; numerous localities in northern and southern Queensland and in the interior, *A. Cunningham*, *F. Mueller*, *M'Gillivray*, *Bowman*, *O'Shanesy* and many others, with very numerous varieties.

N. S. Wales. Port Jackson, *R. Brown*, *Woolls* and others; New England, *C. Stuart*; Liverpool plains, *C. Moore*; Clarence River, *Wilcox*; Richmond River, *Fawcett*; Lachlan and Darling Rivers, *A. Cunningham*, *Dallachy* and others; chiefly with small spikelets.

Victoria. Dandenong Ranges, King, Murray and Ovens Rivers, *F. Mueller*; Glenelg River, *Robertson*.

W. Australia. Blackwood River, *Walcot*; Murchison River, *Oldfield*.

Var. *interrupta*. A larger plant, often 3 or 4 ft. high, with long flat leaves and large spikelets in dense distinct clusters.—*Poa interrupta*, R. Br. Prod. 180; *Eragrostis interrupta*, Steud. Syn. Glum. i. 279.—Endeavour River, *Banks and Solander*; Hervey Bay, *R. Brown*; Clarence River, *Wilcox*; Tweed River, *C. Moore*; also in *Leichhardt's* collection.

Var. *patens*. Panicle loose, often spreading. Spikelets rather small, most of them shortly pedicellate.—Port Jackson and Blue Mountains, *R. Brown*, *Woolls* and others; Victoria, *F. Mueller*.

The species appears to be widely spread in East India and should probably include *E. zeylanica*, Nees, and some others, and comes very close to some American ones.

E. Urvillei, Steud. Syn. Glum. i. 279, from New Holland, *D'Urville*, is unknown to me, but there is nothing in Steudel's diagnosis to distinguish it from. *E. Brownii*.

12. **E. concinna,** *Steud. Syn. Glum.* i. 279.—A rigid tufted grass under 1 ft. and often under 6 in. high. Leaves convolute, subulate, erect, glabrous except a few cilia at the orifice and margins of the sheaths. Panicle reduced to an interrupted spike shorter than the leaves. Spikelets sessile or nearly so, in dense clusters but not numerous, erect, very flat, pale-coloured, 3 to 5 lines long and 1½ lines broad, with 10 to 20 or even more flowers, the rhachis at length articulate. Flowering glumes closely distichous, rather rigid, 1½ lines long, the lateral nerve on the middle of each side very prominent. Palea rather broad, the keels ciliate especially in the upper half with long rigid cilia. Stamens 2, with very small anthers.—*Poa concinna*, R. Br. Prod. 180.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown* (according to his herbarium, but marked in the Prodromus by mistake as from Port Jackson).

Central Australia. Lake Eyre, *Andrews*, *Lewis*.

13. **E. speciosa,** *Steud. Syn. Glum.* i. 279.—Stems 2 to 3 ft. high. Leaves long and narrow, convolute, almost filiform, glabrous. Panicle long and narrow or with a few long erect branches, the lower ones distant. Spikelets sessile, more or less clustered, glabrous, of a pale or leaden colour, very flat and neat, 3 to 6 lines long, about ¾ line broad, with 10 to 20 flowers in some specimens, as many as 40 in others, the rhachis scarcely articulate. Glumes very thin, obtuse, ¾ line long, the lateral nerve prominent at the base on each side. Palea not ¼ as long, curved, truncate, persistent. Stamens 2 in the flowers examined.—*Poa elegans*, R. Br. Prod. 181; *P. speciosa*, Rœm. and Schult. Syst. ii. 573.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown.*

Queensland. Robinson River, *Armit;* Gracemere, *O'Shanesy;* King's Creek, *Bowman.*

Central Australia. Hamilton River, *M'Douall Stuart*

14. **E. laniflora,** *Benth.*—Rhizome and somewhat bulbous bases of the stems woolly-hairy. Stems 1 to 1½ ft. high, slightly cottony at the nodes. Leaves narrow, flat, with scabrous sheaths. Panicle loose, 4 to 6 in. long, with few divaricate or reflexed scabrous branches. Spikelets very shortly pedicellate and not numerous, divaricate or reflexed, very flat, 4 to 8 in. long, nearly 2 lines broad with 20 to 50 flowers, the rhachis tardily articulate. Glumes rather broad, very thin, closely distichous, enveloped at the base in woolly hairs. Palea nearly as long, the keels ciliate with soft hairs near the base. Stamens 3, with rather long anthers. Grain globular.

N. S. Wales. Darling River, *Mrs. Forde.*

Central Australia. Lake Eyre, *Andrews;* Charlotte Waters and towards West Australia, *Giles.*

15. **E. eriopoda,** *Benth.*—Stems 1 to 1½ ft. high, somewhat bulbous and densely woolly at the base. Leaves very narrow, short, the lower sheaths pubescent or hirsute. Panicle in some specimens reduced to an interrupted spike, in others divided into spreading branches. Spikelets nearly sessile, scattered or in pairs, very flat, 3 to 9 lines long, above 1 line broad, with 10 to 30 or more flowers. Glumes closely distichous but rather spreading, obtuse, almost hyaline with a dark green nerve on each side, glabrous. Palea as long. Stamens 2 only in all the flowers examined, with rather large anthers.

N. Australia. Cygnet Bay, N. W. coast, *A. Cunningham;* Dampier's Archipelago, *Walcot.*

16. **E. chætophylla,** *Steud. Syn. Glum.* i. 279.—Stems from a shortly thickened almost bulbous slightly woolly-hairy base densely tufted, slender but rigid, 6 in. to 1 ft. high, often leafy to the inflorescence. Leaves very narrow, convolute or setaceous, glabrous. Panicle narrow, 1½ to 3 in. long, shortly branched. Spikelets usually rather numerous, shortly pedicellate, scattered or crowded, flat and thin, 2 to 4 or rarely 6 lines long, 1 to 1¼ lines broad, 6- to 30-flowered.

Glumes closely distichous or rather loose, ¾ line long, obtuse or almost acute, hyaline or purplish, the lateral nerve prominent on each side at the base. Palea nearly as long, glabrous. Stamens 3. Grain small, ovoid-oblong.—*E. setifolia*, Nees in Hook. Lond. Journ. ii. 419, not of Benth.; *Poa diandra*, F. Muell. Rep. Babb. Exped. 21, not of R. Br.

N. Australia. Cygnet Bay, N. W. Coast, *A. Cunningham.*

Queensland. Mitchell District, *Birch.*

N. S. Wales. Plains of the Lachlan and Darling, *A. Cunningham, Mitchell, Burkitt.*

S. Australia. Cudnaka and Murray River, *F. Mueller;* Sturt's Creek, *Babbage's Expedition;* Charlotte Waters, *Giles;* Lake Eyre, *Andrews.*

W. Australia. Murchison River, *Oldfield;* Fraser's Range. *Dempster.*

Var. ? *pauciflora.* Spikelets small, few-flowered, most of them however imperfectly developed in the specimens seen.—Lake Eyre, *Andrews.*

SECT. III. CYLINDROSTACHYA.—Spikelets very narrow, terete or nearly so, the rhachis scarcely or tardily articulate. Glumes closely appressed. Palea usually persistent.

17. **E. lacunaria,** *F. Muell. Herb.*—Stems slender, almost filiform but rigid, 6 in. to 1 ft. or rarely 1½ ft. high, the base sometimes almost bulbous but glabrous. Leaves very narrow, almost setaceous, usually short. Panicle loose, 2 to 4 in. long, with short spreading rather rigid branches. Spikelets few on the branches, shortly pedicellate, very narrow, 3 to 6 lines long, 10- to 24-flowered, terete or very slightly flattened. Flowering glumes closely appressed, broad, obtuse, scarcely ¾ line long, usually purple, keeled, but the lateral nerves very faint or obsolete, the rhachis scarcely articulate. Palea nearly as long.

Queensland. Gracemere, *O'Shanesy;* near the Barcoo, *Birch;* Darling Downs, *Law;* also in *Mitchell's* subtropical collection.

N. S. Wales. Mount Murchison, *Dallachy.*

S. Australia. Morunda, Murray River, *F. Mueller;* Lake Eyre, *Andrews.*

With the habit and inflorescence nearly of *E. chætophylla*, this has the spikelets rather of *E. falcata.*

18. **E. falcata,** *Gaudich. in Freyc. Voy. Bot.* 408, *t.* 25.—A slender tufted glabrous grass, varying from a few inches to about 1 ft. high. Leaves narrow, convolute, erect. Panicle narrow, usually secund, slightly compound, 2 to 4 in. long. Spikelets sessile or nearly so, crowded or clustered along the short branches, very narrow, nearly terete, often curved, from 4 or 5 lines to 1 in. long and about ½ line broad, with 12 to 50 or even more flowers, the rhachis scarcely articulate. Flowering glumes closely appressed, scarcely 1 line long, obtuse, hyaline at the end, the keel and a lateral nerve on each side very prominent. Palea rather shorter, curved, persistent. Styles slender. Grain ovate, flattened.—*Poa falcata*, Gaudich. l. c.

Queensland. Mitchell District, *Birch.*

N. S. Wales. From the Lachlan and Darling to the Barrier Range, *Victorian Expedition* and many others.

Victoria. Wimmera, *Herb. F. Mueller.*

S. Australia. Morunda on the Murray, *F. Mueller;* Alice Springs and Charlotte Waters, *Giles;* Lake Eyre, *Andrews.*

W. Australia. Sharks Bay, (*Gaudichaud*); Swan River, *Drummond, 1st coll., also n.* 149, 974, 975; Murchison River, *Oldfield;* Fraser's Range, *Dempster.*

Some depauperate dwarf specimens from the Darling, *Mrs. Forde*, have the panicle reduced to 1 to 3 or 4 very long attenuated spikelets, but the structure is the same.

19. **E. stenostachya,** *Steud. Syn. Glum.* i. 279.—Stems above 1 ft. high, slender. Leaves very narrow, glabrous. Panicle with few horizontally divaricate slender but rigid branches. Spikelets sessile or nearly so, scattered or clustered, horizontally divaricate or reflexed, about 3 lines long, very narrow, acute, almost terete, glabrous, 8- to 10-flowered, the rhachis not articulate. Flowering glumes closely appressed, rather obtuse, thin almost hyaline, the nerves scarcely conspicuous. Palea rather shorter, very narrow.—*Poa stenostachya*, R. Br. Prod. 181.

Queensland. Endeavour River, *Banks and Solander*, a single specimen in Herb. Banks.

Var. ?*floribunda.* Leaves divaricate, 4 to 6 in. long, the orifice of the sheath bearded with a few long hairs. Panicle longer, with more numerous spikelets, but their shape and divaricate or reflexed position the same as in Banks's specimen.

N. Australia. Port Darwin, *Schultz, n.* 802.

92. POA, Linn.

Spikelets several- usually few-flowered, in a panicle usually loose and spreading rarely narrow and spikelike, the rhachis of the spikelet articulate between the flowering glumes. Glumes keeled, unawned, the outer empty ones rather short, 1- or 3-nerved, sometimes acute, the flowering ones usually obtuse, 5-nerved, often surrounded by a few loose woolly hairs, rarely with 7 or more nerves. Palea nearly as long, prominently 2-nerved or 2-keeled. Grain enclosed in the glume and palea and falling off with them, but free or rarely adnate to the palea.

The genus is the most widely diffused over the globe in the whole Order, chiefly in temperate and cool regions, reaching the Arctic circle and Alpine summits. Of the eight Australian species one is a common European weed probably introduced, one or perhaps two are also in New Zealand, the remaining six or five appear to be endemic.

Perennials. Grain adhering to the palea.
  Panicle narrow and dense, the spikelets crowded. Rigid maritime grass . . . . 1. *P. Billardieri.*
  Panicle small and loose. (Plant imperfectly known) . . 2. *P. homomalla.*
Perennials. Grain enclosed in the glume and palea but free from them.
  Leaves setaceous or rigid and convolute or flat ending in long points. Panicle dense and contracted or spreading. Spikelets usually 4- to 6-flowered. Glumes and palea glabrous or with woolly hairs at the base . 3. *P. cæspitosa.*

Leaves convolute. Panicle loose with long capillary branches. Spikelets 2- or 3-flowered . . . . . . 4. *P. Maxwelli.*
Leaves flat, narrow, acuminate. Panicle rather dense. Spikelets 5- to 8-flowered, the keels of the glumes ciliate-pubescent. Stems knotty at the base . . . 5. *P. nodosa.*
Leaves flat, rigid, obtuse or acute. Panicle spikelike but loose. Spikelets 3- or 4-flowered, glabrous . . . . 6. *P. saxicola.*
Annuals. Leaves flat, flaccid.
Panicle loose. Spikelets 2 lines long. Flowering glumes 5-nerved, glabrous or minutely silky hairs . . . . 7. *P. annua.*
Panicle narrow. Spikelets clustered, 3 lines long. Flowering glumes 7- to 11-nerved, the keel ciliate at the base with long hairs . . . . 8. *P. lepida.*

1. **P. Billardieri,** *Steud. Syn. Glum.* i. 262.—A rigid erect maritime grass, much branched at the base, from under 1 ft. to 3 ft. high. Leaves terete often slender but rigid, smooth, often exceeding the panicle. Panicle dense and narrow though often much branched, about 2 in. long in the smaller specimens, 6 to 8 in. in the larger ones, with erect branches. Spikelets crowded, erect, mostly about 3 lines long, 4- to 6-flowered. Flowering glumes surrounded by a few fine woolly hairs, nearly 2 lines long, firm and straw-coloured when fully out, obtuse or slightly notched, 5-nerved but one of the nerves on each side often very faint, the keel ciliate below the middle. Grain broadly furrowed next to the palea and adnate to it when ripe.—*Arundo poæformis,* Labill. Pl. Nov. Holl. i. 27, *t.* 35; *Poa australis* var. *Billardieri,* Hook. f. Fl. Tasm. ii. 123.

N. Australia. Cygnet Bay, N. W. Coast, *A. Cunningham.*
Tasmania, *Labillardière,* and some others.
W. Australia, *Drummond;* South West Bay, *A. Cunningham.*

In flower this species is difficult to distinguish from some specimens of the typical form of *P. cæspitosa,* though it has generally a denser more erect panicle, with more paleaceous spikelets, but the grain when ripe is very different. It is possible that some of the specimens I have included in *P. cæspitosa,* having seen them in flower only, may belong to *P. Billardieri,* especially some of the maritime ones from Lord Howe's Island; and some from Portland in Victoria.

2. **P. homomalla,** *Nees in Pl. Preiss.* ii. 104.—A grass of 1 ft. or more, the stems nearly simple. Leaves flat, 1 line broad, with very flat striate sheaths, the ligula conspicuous. Panicle narrow, loose, 1 to 2 in. long with erect flexuose rather rigid secund branches, the lower ones divided. Spikelets about 1 line long, 2- or 3-flowered. Outer glumes glabrous, flowering glumes silky-glabrous, rather obtuse, 5-nerved. Grain adnate to the palea and glume.

W. Australia. Toodyay Valley, *Preiss, n.* 1829. The only specimen I have seen is too imperfect for description, and the above character is taken chiefly from Nees. Some imperfect specimens from Kari Dale, *Walcot,* may belong to the same species, but the grain is not yet sufficiently formed to determine them.

3. **P. cæspitosa,** *Forst.; Spreng. Mant.* i. *Fl. Hal.* 33, *and in Mem. Acad. Petersb.* ii. (1807–8), 802, *t.* 8.—An exceedingly variable

species from under 1 ft. to 3 ft. high, usually densely tufted and glabrous. Leaves narrow, flat convolute or setaceous, chiefly at the base, sometimes longer than the inflorescence, sometimes very short, the ligula always very short or obsolete. Panicle branched, compact or spreading. Spikelets usually 4- to 6-flowered. Flowering glumes usually surrounded by a few fine woolly hairs but sometimes the whole spikelet glabrous, the cilia of the palea-keels when present very minute. Grain oblong, usually narrow, enclosed in the glume and palea but free from them.—*P. australis*, *P. lævis*, *P. plebeia* and *P. affinis*, R. Br. Prod. 179; *P. australis*, Hook. f. Fl. Tasm. ii. 123, except the var. *a.*

Queensland. Only known from the districts bordering on N. S. Wales, *Beckler*, *Bailey*.

N. S. Wales, Victoria, Tasmania, and **W. Australia.** Appears to be abundant in the settled and moister or richer districts of these colonies, from whence we have specimens from stations far too numerous to particularise, but I have seen scarcely any from the desert interior. The species is also in New Zealand.

The variations of the species are very great and it is difficult to combine them all into a single one, yet they appear to be so closely connected by numerous intermediates, that precise characters cannot be given to the different forms, of which the following are the most prominent.

The typical form, agreeing fairly with Sprengel's figure and description (taken it is said from a New Zealand specimen of Forster's), is well represented by some specimens from Lord Howe's Island, *Fullagar*, with tall leafy stems, the long convolute smooth leaves exceeding the panicle. Glumes about 2 lines long. These specimens approach in habit the *P. Billardieri*, but in the few seeding ones seen the grain is certainly narrow and free.

Var. *plebeia*. Tall and leafy. Leaves narrow, flat or more or less convolute. Panicle exceeding the leaves, rather large and loose. Glumes 2 to 2½ lines long, usually surrounded by a few woolly hairs.—*P. plebeia*, R. Br.; Nees in Pl. Preiss. ii. 105.—Chiefly in N. S. Wales and in W. Australia (*Preiss*, *n.* 1860, *Drummond*, *n.* 449 partly; Port Jackson, *R. Brown*).

Var. *serpentum*.—Like the var. *plebeia* or the var. *affinis*, but the rhachis of the spikelet and base of the glumes perfectly glabrous.—*P. serpentum*, Nees in Pl. Preiss. ii. 106.—Apparently common in W. Australia.

Var. *latifolia*. Very tall and luxuriant, with flat leaves often 2 to 4 lines broad.—A very few specimens from Illawarra, *Johnson*, and Munyong Mountains, *F. Mueller*.

Var. *lævis*. Leaves, when most characteristic, rigid, erect, terete, smooth and shining, and the panicle contracted, but in many specimens the leaves more slender and sometimes filiform as in the var. *australis*, but always quite smooth, the stem then taller and the panicle more diffuse. Glumes usually about 1¼ lines long.—*P. lævis*, R. Br.; Nees in Pl. Preiss. ii. 275; *P. affinis*, Nees, l. c. 105.—Numerous specimens chiefly from the southern colonies, (*Preiss*, *n*, 1830, 1857, *Drummond*, *n.* 168 *and* 449 partly; Kent's Group and King George's Sound, *R. Brown.*)

Var. *alpina*, F. Muell. A dwarf tufted form, with the rigid smooth leaves of the var. *lævis* and the short loose panicles of some specimens of the var. *australis*.—Mount Wellington in Tasmania, *Gunn*, *Oldfield*.

Var. *affinis*. Leaves very narrow but often flat as in the var. *plebeia*, but the panicle more diffuse, with more numerous smaller spikelets, the glumes usually under 1¼ lines long.—*P. affinis*, R. Br.—One of the commonest forms in the eastern colonies but passing much into the smooth *P. australis* and into *P. lævis*, in W. Australia often loosing the woolly hairs of the spikelet and passing into *P. serpentum*, (Port Jackson, *R. Brown ;* W. Australia, *Drummond, n.* 981, etc.)

Var. *australis*. Leaves mostly radical, setaceous, much shorter than the stem, erect and exceedingly scabrous. Stems under 1 ft. high with a very loose spreading rather small panicle. Glumes 1 to 1½ lines long.—*P. australis*, R. Br. Prod. 179 ; Nees in Sieb. Agrost. n. 77 ; *P. Sieberiana*, Spreng. Syst. Cur. Post, 35 ; *P. implexa*, Trin. in Mem. Acad. Petersb. ser. 6. i. 388. Tasmania, very abundant (*R. Brown*, etc.) as above described. In Victoria and N. S. Wales the radical leaves are generally longer and the stem taller ; in the northern districts is a common form with very long scabrous filiform leaves, and in N. S. Wales, Victoria and S. Australia t passes frequently into *P. affinis*. In Tasmania and Victoria is a not uncommon form with the habit and setaceous leaves of the typical one but perfectly smooth. *P. porphyroclados*, Nees in Pl. Preiss. ii. 105, from W. Australia, would from his character be the true *P. australis*, but I have seen no western specimens with setaceous very scabrous leaves.

Var. *tenera*. A slender weak variety, with very narrow or filiform but flaccid eaves, and a loose spreading rather small panicle with small spikelets, the glumes scarcely 1 line long.—*P. tenera*, F. Muell. in Hook. f. Fl. Tasm. ii. 124, t. 164 ; *P. effusa*, Steud. Syn. Glum. i. 262.—Woods and shady places, N. S. Wales, Victoria and Tasmania.

4. **P. Maxwelli,** *Benth.*—An erect tufted glabrous smooth and shining grass of 2 or 3 ft. or more. Leaves long, convolute, almost subulate. Panicle from a few inches to 1 ft. long, narrow but very loose, the long capillary branches more or less divided, the lower ones in distant clusters, the upper ones scattered. Spikelets very shortly pedicellate along the branches, scarcely 2 lines long, glabrous, 2- or 3-flowered. Flowering glumes rather broad, very obtuse, 5-nerved, with scarious entire or denticulate tips. Palea nearly as long and rather broad, glabrous. Stamens 3. Grain oblong, free.

W. Australia. King George's Sound, *Maxwell.*

5. **P. nodosa,** *Nees in Pl. Preiss.* ii. 105.—Stems usually about 2 ft. high, forming at the base 1, 2 or 3 superposed globular or ovoid nodules, 3 or 4 lines diameter. Leaves long, narrow, flat, usually scabrous. Panicle loose, narrow or spreading. Spikelets 3 to 4 lines long, 5- to 8-flowered, rather narrow at first with closely appressed glumes, at length broad and flat, the glumes spreading out. Flowering glumes about 2 lines long, 5-nerved, without the woolly hairs at the base of most *Poæ*, but shortly ciliate-pubescent on the keel and margins below the middle. Palea nearly as long, the keels minutely ciliate-pubescent or glabrous. Grain free.—F. Muell. Fragm. viii. 132 ; *P. brizochloa*, F. Muell. in Trans. Vict. Inst. 1855, 45 ; *P. Drummondiana*, Nees in Hook. Lond. Journ. ii. 418 ; *P. cognata*, Steud. Syn. Glum. i. 262.

S. Australia. Lofty Ranges and other localities from St. Vincent's Gulf to the Murray, *F. Mueller.*

W. Australia. Swan River, *Oldfield, Drummond, n.* 169 *and* 398 *or* 389 ; Champion Bay and Gordon River, *Oldfield ;* near Limekiln, *Preiss, n.* 1852 ; West Bay, *Maxwell.*

When fully out the spikelets are broad almost like those of a *Briza*, but in many specimens both from S. and West Australia they are lanceolate close and rather thick, but apparently the difference is owing to a different stage of development rather than to any distinction of race.

6. **P. saxicola,** *R. Br. Prod.* 180.—A glabrous perennial, 1 to 1½ ft. high. Leaves few, flat, rigid, acute or almost obtuse, 1 to 2 lines broad, the upper ones small and distant with long sheaths. Panicle on a long peduncle, very narrow, with few erect branches. Spikelets few, oblong, about 3 lines long, 3- or 4-flowered, the rhachis glabrous. Flowering glumes broad, rather obtuse, about 1½ lines long, closely imbricate, minutely ciliate, the keel rather prominent, the lateral nerves very faint, 2 on each side. Grain not seen.—Hook. f. Fl. Tasm. ii. 125, t. 164.

Tasmania. Summit of Mount Wellington, *R. Brown*, *Gunn*. Apparently a very distinct species more nearly allied to *P. nodosa* than to *P. cæspitosa*, but I have only seen the specimen figured by J. D. Hooker and two in Herb. R. Brown.

* 7. **P. annua,** *Linn.; Kunth, Enum.* i. 349.—A tufted annual, often only 2 or 3 in., and rarely 1 ft. high. Leaves flat, flaccid. Panicle loose and spreading. Spikelets shortly pedicellate, about 2 lines long, 3- to 6-flowered, the rhachis glabrous. Flowering glumes more or less distinctly 5-nerved, with a hyaline apex, the keel often minutely silky-hairy. Grain free, oblong.

A common grass in the northern hemisphere, now a naturalised weed in various countries, said to be abundant in **Victoria**, **Tasmania**, **S. Australia**, and **W. Australia**, as well as in several stations in **N. S. Wales** and in Lord Howe's Island.

8. **P. lepida,** *F. Muell. Fragm.* viii. 130.—An erect annual, varying from 2 or 3 in. to nearly 1 ft. high, more slender and less spreading than *P. annua*. Leaves flat, flaccid, the ligula rather long, jagged. Panicle very narrow, almost spikelike, 1 to 2 in. long. Spikelets not numerous, nearly sessile, clustered on the very short branches, very flat, about 3 lines long, 5- to 7- or more-flowered, the rhachis more or less silky-hairy. Flowering glumes narrow, obtuse, nearly 1½ lines long, 7- to 11-nerved, the keel prominent, ciliate with long hairs below the middle; outer glumes 3-nerved. Grain apparently broader than in most *Poæ* and broadly furrowed, but not seen ripe.

N. S. Wales. Murray and Darling Rivers, *Victorian Expedition;* Lachlan and Darling Rivers, *Burkitt.*

S. Australia. Crystal Brook, *F. Mueller*, near Lake Greenley, *Wilhelmi.*

93. SCHEDONORUS, Beauv.

Spikelets several-flowered, flattened, in a narrow and spikelike or loose and spreading panicle, the rhachis of the spikelet glabrous or slightly hairy, articulate under the flowering glumes. Outer empty glumes narrow, acute, keeled or 3-nerved. Flowering glumes usually 5-nerved, rounded on the back at the base, obtuse or shortly notched at the apex, the keel prominent at least in the upper part and usually produced into a minute point in or just below the notch. Palea nearly as long, usually rather broad prominently 2-nerved. Styles distinct, slightly excentrical. Grain very obtuse, usually broadly furrowed, free from the palea.

The genus comprises several species, chiefly from the temperate regions of the northern or the southern hemisphere; its limits are however as yet very unsettled. Of the three Australian species, one is also in New Zealand, the other two appear to be endemic. The name of the genus is frequently spelt by mistake *Schenodorus*, even in Beauvois' own Index, but the etymology given shows that the spelling *Schedonorus*, as given in the text p. 99 is the correct one. Fries and other modern botanists have given the genus a different signification from that originally contemplated by the author, including species which have the habit and characters rather of *Bromus*. As here understood, it differs from *Bromus* in the glabrous ovary, from *Festuca* in the flowering glume and from both in the free grain, in which it approaches *Poa* and *Glyceria*, but differs in the flowering glume and grain and somewhat in habit.

Panicle narrow, dense and spikelike or interrupted.
  Leaves none except sheathing scales at the base of the stem . . . . 1. *S. scirpoideus.*
  Leaves long erect and rigid . . . . 2. *S. littoralis.*
Panicle loose and spreading . . . . 3. *S. Hookerianus.*

(See also *Poa Billardieri*, which has the grain furrowed as in *Schedonorus*.)

1. **S. scirpoideus,** *Benth.*—Stems rushlike, terete, rigid, 2 to 4 ft. high, leafless except membranous closely appressed sheathing scales at the base, the longest inner one 6 to 8 in. long, Panicle narrow and spikelike but interrupted, 2 to 8 in. long. Spikelets pedicellate, 2 or 3 together on very short erect branches or the upper ones solitary, flat, oval or oblong, 4 to 8 lines long, 6- to 8-flowered. Glumes straw-coloured or pale-brown, rigid, about 3 lines long, the flowering ones obtuse or slightly notched with the keel produced into a short point in some specimens, not protruding in others, the 2 outer empty ones more acute and keeled from the base. Ovary glabrous. Styles rather longer with darker coloured stigmas than in most Festucaceæ. Grain free and furrowed, but not seen ripe.—*Brizopyrum scirpoideum*, Steud. Syn. Glum. i. 282; *Festuca scirpoidea*, F. Muell. Fragm, viii. 129.

W. Australia, *Drummond, n.* 102, 156.

2. **S. littoralis,** *Beauv. Agrost.* 99.—Stems 1 to 3 ft. high, forming dense hard tufts of a pale yellow colour. Leaves nearly cylindrical, erect, rigid, pungent-pointed, glabrous, often as long as the stems. Panicle narrow, dense and spikelike, 2 to 4 in. long. Spikelets few, flat, erect, 7 to 9 lines long, 6- to 8-flowered. Glumes about 4 lines long, rigid, straw-coloured, the flowering ones with 2 nerves on each side of the keel, acute or dilated and notched at the tip, the keel usually slightly protruding, the 2 outer empty ones narrower, 3-nerved, acute.

Rhachis of the spikelet shortly hairy.—*Festuca littoralis*, Labill. Pl. Nov. Holl. i. 22, t. 27; R. Br. Prod. 178; Hook. f. Fl. Tasm. ii. 128; Sieb. Agrostoth. n. 58; *Arundo triodioides*, Trin. Spec. Gram. t. 351; *Schedonorus Billardierianus*, Nees in Hook. Lond. Journ. ii. 419.

Queensland. Moreton Island, *F. Mueller.*
N. S. Wales. Port Jackson, *R. Brown*, *Woolls;* also in *Leichhardt's* collection.
Victoria. Sea-shore, Port Phillip, *Adamson;* Wilson's Promontory, *F. Mueller.*
Tasmania, *Labillardière;* abundant on rocks and sandhills near the coast, *J. D. Hooker;* King's Island, *Neate.*
S. Australia. Lake Alexandrina, *F. Mueller.*

Var. *triticoides*. Stems taller and spikelets larger than in the typical form. Glumes about ½ in. long, the outer empty ones often 5-nerved and the flowering ones 7-nerved.—*Festuca triticoides*, Steud. Syn. Glum. i. 315.

W. Australia, *Drummond, n* 70, 150, 377, 393.

3. **S. Hookerianus,** *Benth.*—A stout perennial of 2 to 4 ft., glabrous or slightly scabrous-pubescent. Leaves flat, rather long. Panicle very loose, 6 in. to 1 ft. long, with rather short and erect or long and spreading branches. Spikelets numerous, 4 to 5 lines long, 4- to 6-flowered. Flowering glumes rigidly membranous, about 3 lines long, keeled only in the upper part, the tip hyaline, entire or notched, the keel produced into a short point; outer glumes shorter, unequal, prominently keeled, the 2nd often 3-nerved.—*Festuca Hookeriana*, F. Muell. in Hook. Fl. Tasm. ii. 127, t. 165; *Poa Hookeriana*, F. Muell. Fragm. viii. 131.

Victoria. Berrima and Cobberas Mountains, Australian Alps, *F. Mueller;* cultivated at Ballarat, *Bacchus.*
Tasmania. Cheshunt, *Archer;* Meander River, *C. Stuart.*

94. GLYCERIA, R. Br.

Spikelets several-flowered, pedicellate in a narrow or spreading panicle, the rhachis of the spikelet articulate under the flowering glumes, glabrous or rarely hairy. Outer empty glumes obtuse or acute, unawned. Flowering glumes convex on the back, 3- to 9-nerved, the nerves not reaching to the hyaline obtuse sometimes slightly denticulate apex. Palea nearly as long as the glume. Ovary glabrous. Styles distinct, very short, the plumose stigmas frequently more branched than in other genera. Grain glabrous, enclosed in the glume and palea but free from them.

The genus is widely distributed over the temperate and some warmer regions of the globe. Of the seven Australian species, one has an extensive range in the northern hemisphere both in the New and the Old World, one extends to New Zealand, the remaining five appear to be endemic.

Brown called attention to two remarkable characters in the typical species, the union of the two lodicules, and the ramification of the stigmatic hairs, which are most marked in the *G. fluitans* and exist to a certain degree in some other species. They are however, as far as has been observed, not constant in all the species which have been included in the genus, which requires further revision in connection with some closely allied ones from the northern hemisphere.

Flowering glumes with a tuft of hairs round the base or on the back below the middle. Panicle loose . . . 1. *G. Fordeana.*
Rhachis and base of the flowering glumes glabrous or minutely pubescent.
  Stems rarely 3 ft. high. Panicle narrow.
    Panicle long and loose. Spikelets ½ to 1 in. Flowering glumes distant, narrow, 3 lines long, outer glumes much shorter . . . . 2. *G. fluitans.*
    Panicle dense. Spikelets few, broad, ½ to ¾ in. Flowering glumes paleaceous, 3 to 4 lines long, outer glumes as long . . . . 3. *G. latispicea.*
    Panicle dense. Spikelets numerous, narrow, 3 to 4 lines. Flowering glumes 1½ lines long . . . . 4. *G. stricta.*
  Stems 6 to 12 ft. high, stout, with long leaves. Panicle long and loose. Spikelets numerous, 3 to 4 lines long . . . . 5. *G. dives.*
  Stems very rigid, tall with few short leaves and often clusters of short branches. Flowering glumes hyaline, 3-nerved at the base.
    Panicle very spreading. Spikelets 6- to 12-flowered. Eastern species . . . . 6. *G. ramigera.*
    Panicle oblong, erect. Spikelets numerous, 4- to 6-flowered. Western species . . . . 7. *G. australasica.*

1. **G. Fordeana,** *F. Muell. Fragm.* viii. 130.—An erect glabrous grass attaining 2 or 3 ft. Leaves flat, very scabrous. Panicle very loose, compound, 4 to 8 in. long, with very spreading capillary branches, mostly in pairs or threes. Spikelets lanceolate, mostly 4 to 5 lines long, 8- to 12-flowered. Outer glumes acute, 3-nerved; flowering glumes 5- or 7-nerved, 1½ lines long, surrounded by a tuft of hairs and shortly hairy or pubescent in the lower part, the midrib prominent but not reaching the obtuse hyaline apex, the lateral nerves shorter. Palea-keels scarcely ciliate.—*Poa Fordeana*, F. Muell. l. c.

N. S. Wales. Darling River, *Mrs. Forde;* Lachlan River, *Burkitt;* Mount Murchison, *Bonney.*
Victoria. Murray River, *F. Mueller;* Wimmera, *Wilson.*

2. **G. fluitans,** *R. Br. Prod.* 179.—Stems creeping in mud or floating at the base, ascending to 2 or 3 ft. Leaves narrow, flat, glabrous, the ligula jagged. Panicle loose, long and narrow. Spikelets solitary in the distant notches or 2 or 3 on a short branch from the same notch, erect, narrow, ½ to 1 in. long, 6- to 20-flowered, the rhachis glabrous as well as the glumes. Outer glumes broad, obtuse, hyaline, faintly nerved at the base, the lowest about 1½ lines, the 2nd longer; flowering glumes more rigid, about 3 lines long, with about 7 nerves not reaching to the hyaline obtuse entire or slightly denticulate apex.

Lodicules usually connate.—Hook. f. Fl. Tasm. ii. 122; Reichb. Ic. Fl. Germ. t. 80; *Festuca fluitans*, Linn.; F. Muell. Fragm. viii. 129.

N. S. Wales. Port Jackson, *R. Brown*, *Woolls;* New England, *Leichhardt.*

Victoria. Black Forest, Curdie's River, Mitta-Mitta, Loddon, etc., *F. Mueller;* Ballarat, *Bacchus.*

Tasmania. Common in wet places, *J. D. Hooker.*

W. Australia. *Porroteranthe Drummondii*, Steud. Syn. Glum. i. 287, from *Drummond's* collection, n. 390 and 977 (277 in Herb. Hook.), appears to be a variety or small leafy state of *G. fluitans*, with the flowering glumes more distant than usual along the rhachis.

The species is abundant in the northern hemisphere, in the New as well as the Old World.

3. **G. latispicea**, *F. Muell. Fragm.* viii. 127.—Stems erect, attaining 2 or 3 ft. Leaves flat, glabrous, the ligula long and jagged. Panicle narrow, the branches very short, erect, each bearing 1 to 3 spikelets, the lower ones distant. Spikelets rather broad and loose, ½ in. long or rather more, pale-coloured, 6- to 12-flowered, the rhachis as well as the glumes glabrous or very minutely hairy. Outer glumes obtuse, 5-nerved; flowering ones 3 to 4 lines long, 7- or 9-nerved, rounded on the back as in the rest of the genus but the midrib reaching the obtuse hyaline apex, the lateral nerves faint and shorter. Grain oblong, flattened but concave on the inner face. — *Festuca latispicea*, F. Muell. l. c.

N. S. Wales. Gwidir River and Myall Creek, *Leichhardt;* New England, *C. Stuart.* The specimens seen are few and the species requires further elucidation. It seems in some respects to approach *Schedonorus*, and the grain is rather narrower than in most *Glyceria*, but not seen quite ripe.

4. **G. stricta**, *Hook. f. Fl. Nov. Zel.* i. 304, *Fl. Tasm.* ii. 123, *t.* 162. —A tufted glabrous erect annual of 1 to 1½ ft. Leaves very narrow, erect, with broad loose sheaths. Panicle narrow, 3 to 6 in. long, the branches clustered, erect or at length spreading, the lower ones often long. Spikelets narrow, 3 to 4 lines long, 5- to 8-flowered, the rhachis glabrous as well as the glumes. Outer glumes unequal, 3-nerved, flowering glumes 1¼ lines long, 5-nerved, none of the nerves reaching the obtuse hyaline apex. Lodicules distinct, exceedingly thin and delicate. Grain concave on the inner face.—*Poa syrtica*, F. Muell. in Trans. Vict. Inst. 1855, 45; *Festuca syrtica*, F. Muell. Fragm. viii. 130.

Victoria. Marshy ground, Melbourne, *Adamson.*

Tasmania. Marshes, Launceston, *Gunn.*

S. Australia. Sandy shores of Spencer's and St. Vincent's Gulfs, *F. Mueller.*

W. Australia, *Drummond*, *n.* 60, 150, 219; Busselton, *Pries* (with the spikelets almost sessile and crowded on the short branches).

G. tenuispica, Steud. Syn. Glum. i. 285, is founded on small specimens of *Drummond's*, *n.* 347, in fruit with many of the branches spreading and several of the fruits fallen away.

The species is also in New Zealand.

5. **G. dives,** *F. Muell. Herb.*—A stout erect glabrous grass attaining 10 to 12 feet. Leaves flat, long and broad or narrow, with long loose sheaths. Panicle very loose and spreading, 6 in. to 1 ft. long, with long capillary branches. Spikelets 4 to 5 lines long, 4- to 6-flowered, the rhachis glabrous. Outer glumes acute, prominently 3-nerved, the longest about 2 lines long; flowering glumes nearly 3 lines long, broad, with 5 prominent scabrous nerves, not reaching the hyaline tip, the margins as well as the keels of the palea shortly ciliate. Lodicules slightly united at the base.—***Festuca dives,*** F. Muell. Fragm. iii. 147, viii. 129.

Victoria. Upper Yarra, Dandenong Range, Bunip Creek, *F. Mueller.*

6. **G. ramigera,** *F. Muell. Fragm.* viii. 131.—A tall glabrous rigid almost Bamboo-like grass, branched at the base and often bearing clusters of branches higher up. Leaves convolute and flat, few and short on the flowering stems. Panicle 4 to 8 in. long, loosely ovate or at length very spreading. Spikelets rather numerous, usually 3 to 5 lines long with 6 to 12 flowers, but sometimes longer, the rhachis glabrous. Outer glumes narrow, hyaline, acute, faintly 1-nerved; flowering glumes distant, about 1½ lines long, broad and concave, hyaline, 3-nerved, the nerves all short, the central one not reaching much above the middle. Grain not seen ripe but apparently that of *Glyceria.*—*Poa ramigera,* F. Muell. in Trans. Vict. Inst. 1855, 45 and Fragm. l. c.

N. S. Wales. Lachlan River, *A. Cunningham ;* Molle's Plains, *Fraser ;* Murrumbidgee and lower Darling Rivers, *Victorian and other Expeditions.*
Victoria. Wimmera, *Wilson* (a very poor specimen).
S. Australia. Murray River, *F. Mueller.*

7. **G. australasica,** *Steud. Syn. Glum.* i. 286.—Stems rigid, erect, glabrous, many feet high. Leaves few short and erect, mostly leaving sheaths only at the time of flowering. Panicle narrow, 3 to 4 in. long with numerous erect slender branches, like that of a *Triodia.* Spikelets erect, narrow, terete, 3 to 4 lines long, 4- to 6-flowered, the rhachis glabrous. Glumes thin and hyaline, the outer ones short, nerveless or the 2nd 1-nerved; flowering glumes 1 to 1¼ lines long, broad, obtuse or slightly jagged, 3-nerved at the base. Grain not seen.

W. Australia. *Drummond, n.* 107, 387. This and the preceding species may possibly prove to be varieties of one, but they appear to me to be distinct.

95. BRIZA, Linn.

Spikelets several-flowered, broad, flattened but thin, on filiform pedicels, in a simple or compound panicle, the rhachis of the spikelet glabrous. Flowering glumes imbricate but spreading, very broad, membranous or scarious, very concave or inflated, unawned. Palea much smaller but very broad and flat. Grain obovate, concave in front, enclosed in the palea and almost vesicular glume, free from them.

A small genus widely spread in its typical form over the temperate regions of the northern and southern hemispheres, and as introduced weeds in some tropical countries, but in a more general sense including the South American genus *Chascolytrum*.

Panicle branched, rather loose and spreading. Spikelets scarcely 2 lines long and broad	1. *B. minor.*
Panicle nearly simple with few spikelets ½ in. long and at least 4 lines broad	2. *B. maxima.*

1. **B. minor,** *Linn.; Kunth, Enum.* i. 372.—An erect annual, from a few inches to about 1 ft. high. Leaves rather short, flat, the ligula scarious and often above 3 lines long. Panicle usually 2 to 3 in. long, much branched and at length spreading, with numerous thick spikelets about 2 lines long and as broad or at length broador.—Reichb. Ic. Fl. Germ. t. 92; F. Muell. Fragm. viii. 125; *B. virens*, Linn.; Nees in Pl. Preiss. ii. 107.

N. S. Wales. Port Jackson and various localities in the interior, *R. Brown*, *Woolls* and others; Lord Howe's Island, *Fullagar.*

Victoria. Common about Melbourne, Ballarat, etc., *F. Mueller*, *Adamson* and others.

Tasmania, *Gunn*, *C. Stuart*, *Story* and others.

S. Australia. Around St. Vincent's and Spencer's Gulfs, *F. Mueller.*

W. Australia. Swan and Blackwood Rivers, *Oldfield.*

Probably of Mediterannean origin but now fully established in extratropical South America and Africa, and though of recent introduction in many parts of Australia, C. Stuart observes that it is found in very remote localities in Tasmania. It is not admitted in Hooker's Flora of Tasmania.

* 2. **B. maxima,** *Linn.; Kunth, Enum.* i. 371.—An erect annual of 1 to 2 ft. Leaves flat, with a rather long ligula. Panicle almost simple, with few large hanging spikelets usually of a rich brown rarely pale green, mostly about ½ in. long, very obtuse, 4 to 5 lines broad.—Reichb. Ic. Fl. Germ. t. 92; F. Muell. Fragm. viii. 125.

A European species, not so widely spread as *B. minor*, but long since cultivated in gardens for ornament and now apparently established in a few localities in **N. S. Wales,** *C. Moore*, **S. Australia,** *F. Mueller*, and **W. Australia,** *Oldfield* and others.

96. BROMUS, Linn.

Spikelets several-flowered, oblong or lanceolate, pedicellate, erect or drooping, in a more or less branched panicle, the rhachis of the spikelet articulate between the flowering glumes, glabrous or scabrous-pubescent. Outer empty glumes acute or fine-pointed, unawned. Flowering glumes convex on the back, 5- or 7-nerved, the hyaline apex usually shortly bifid, the midrib produced into a straight or curved awn free from a little below the apex. Palea nearly as long as the glume, the 2 prominent nerves usually scabrous-ciliate. Ovary obovate, crowned by a hairy membranous appendage, the very short distinct styles more or less lateral. Grain flattened, adhering to the palea, and often more or less to the base of the glume.

The genus is widely distributed over the temperate regions of the globe. Of the three species here enumerated two are probably introduced from Europe, one only appears to be truly indigenous, but is also in New Zealand, and is probably the same as an East Asiatic one.

Spikelets thick, under ¾ in. with the awns. Flowering glumes oblong, turgid, closely imbricate . . . . 1. *B. mollis.*
Spikelets lanceolate, flattened, 1 to 1½ in. long with the awns. Flowering glumes narrow, loosely imbricate . . . . . . 2. *B. arenarius.*
Spikelets linear-lanceolate, flattened, 2 in. long with the awns. Flowering glumes narrow, loosely imbricate . . . . 3. *B. sterilis.*

* 1. **B. mollis,** *Linn.; Kunth, Enum.* i. 413.—An erect grass of 1 to 2 ft., more or less softly pubescent. Leaves flat. Panicle either small with few erect spikelets, or larger and at length drooping. Spikelets oblong or lanceolate, ½ to ¾ in. long, not so flat as in the other species. Glumes mostly about 7-nerved but the nerves sometimes more in the flowering glumes, fewer in the outer ones, the flowering ones about 3 lines long, broad and almost turgid, the fine awn about the length of the glume itself.—Host. Gram. i. t. 19; Reichb. Ic. Fl. Germ. t. 74.

An European grass, now established in various localities in **N. S. Wales, Victoria** and **Tasmania.**

2. **B. arenarius,** *Labill. Pl. Nov. Holl.* i. 23, *t.* 28.—Apparently annual, from 1 ft. to about 1½ ft. high. Leaves flat, flaccid, softly hairy or pubescent. Panicle at first erect at length drooping, the capillary branches clustered, the longer ones 2 to 3 in. long with 1 to 4 spikelets on capillary pedicels. Spikelets lanceolate, ½ to ¾ in. long without the awns, flat, 5- to 9-flowered. Glumes all pubescent or glabrous, the lowest about 3 lines long and 5-nerved, the 2nd longer and 7-nerved, both empty and acute; flowering glumes rather longer, about 7-nerved, convex on the back, the awn free from a little below the scarious tip, ½ to ¾ in. long.—*B. australis,* R. Br. Prod. 178; Nees in Pl. Preiss. ii. 108.

N. S. Wales. Port Jackson, *R. Brown,* and thence in the interior to the Lachlan and Darling, *M'Arthur, Burkitt* and others; Castlereagh River, *Woolls;* Macquarrie, *C. Moore.*

Victoria. Forest Creek, *F. Mueller;* Melbourne, *Adamson;* Portland, *Allitt;* Murray River, *Gummon.*

S. Australia. St. Vincent's Gulf, *F. Mueller, Behr;* Mount Olga, *Giles.*

W. Australia. Swan River, *Oldfield, Drummond, n.* 127, 386, 389, 982, some specimens tall and nearly glabrous, others short and densely pubescent; Rottenest Island, *Preiss, n.* 1828, 1839.

Var. *macrostachya.* Spikelets 1 in. long, each with 15 to 20 flowers.—Yass in the interior of N. S. Wales, *M'Arthur;* Darling River, *Victorian Expedition.*

Munro thinks the species may be the same as the *B. japonicum*, Thunb. If this should be verified Thunberg's name would take precedence over Labillardière's.

* 3. **B. sterilis,** *Linn.*; *Kunth, Enum.* i. 418.—An erect grass of 1 to 2 ft. Leaves flaccid, softly pubescent. Panicle loose with rather long erect at length drooping branches. Spikelets linear-lanceolate, mostly about 1 in. long without the awns, 6- to 8-flowered. Outer glumes narrow, ending in fine points, the lowest keeled, only ⅛ to ¼ in. long, the 2nd longer, 3-nerved. Flowering glumes mostly 5- or 7-nerved, the hyaline tips ending in 2 fine points. Awn much longer than the glume itself, very scabrous.—Reichb. Ic. Fl. Germ. t. 73.

N. S. Wales. Paramatta, *Woolls.*
Victoria. Yarra River, *F. Mueller.*
Tasmania. Swanport, *Story*; Ravenswood, *Bissill*; King's Island, *Neate.*

A common grass in Europe, probably introduced from thence to the above Australian stations.

* 97. CERATOCHLOA, Beauv. and DC.

Spikelets several-flowered, flat, pedicellate, in a branched panicle, the rhachis of the spikelet articulate between the flowering glumes, glabrous. Glumes all complicate, keeled, several-nerved, entire, acute or the flowering ones tapering into a short awn. Palea nearly as long as the glume, prominently 2-nerved. Ovary crowned by a hairy 3-lobed or 3-horned appendage. Styles very short, attached at the base of the lobes. Grain oblong, adnate to the palea, the seed deeply furrowed.

An American genus of few species, of which the typical one (from which alone the above character is taken) has become introduced into Australia as in South Africa. Beauvois expressly states that the genus was concurrently established by De Candolle and himself.

* 1. **C. unioloides,** *DC. Cat. Hort. Monsp.* 92.—An erect grass of 2 ft. or more. Leaves more or less pubescent, with soft spreading hairs. Panicle loose, erect or at length drooping, like that of a *Bromus*. Spikelets lanceolate, resembling those of the North American *Uniolæ*, ¾ to 1¼ in. long, and the flowering glumes about ½ in.—*Festuca unioloides*, Willd. Hort. Berol. 3, t. 3; *Bromus unioloides*, H. B. and K.; Kunth, Enum. i. 415; *B. Willdenownii*, Kunth, l. c. 416; *Ceratochloa festucoides*, Beauv. Agrost. 75, 158, t. 15, f. 7.

An American plant, chiefly western, extending from Patagonia to British Columbia, now reported as naturalised in a few localities in **N. S. Wales, Tasmania,** and **S. Australia,** as in South Africa.

98. FESTUCA, Linn.

Spikelets several-flowered, pedicellate, in loose and spreading or compact and erect more or less one-sided panicles, the rhachis of the spikelet articulate under the flowering glumes, glabrous or nearly so. Outer empty glumes narrow, acute, keeled, usually unequal. Flowering glumes narrow, acute or tapering into an untwisted awn or rarely obtuse, rounded on the back, faintly nerved. Palea narrow, with prominent nerves or keels. Ovary glabrous. Styles very short, distinct. Grain enclosed in the glume and palea and more or less adnate.

The genus is very generally spread over the globe especially in temperate or mountainous regions. Of the three following species one is introduced only from Europe, the other two are common northern ones found also in parts of the southern hemisphere.

F. Mueller, Fragm. viii. 127 et seq. unites *Agropyrum*, *Triodia*, *Diplachne*, *Schedonorus* and *Glyceria* with *Festuca*, but he has not published his character for the composite genus thus formed, nor do I well see how it could be framed without including also *Triticum*, *Poa*, *Bromus* and several others universally acknowledged as distinct.

Annual. Panicle slender, contracted, one-sided. Awns long.
Stamen usually 1 only . . . . 1. *F. bromoides.*
Perennials. Panicle loose. Stamens 3 . . . . 2. *F. duriuscula.*
Small rigid annual. Panicle-branches short, secund. Flowering glumes obtuse, unawned . . . . 3. *F. rigida.*

1. **F. bromoides,** *Linn.; Kunth, Enum.* i. 396.—A slender tufted annual, from a few inches to above 1 ft. high. Leaves chiefly at the base, narrow and convolute, often quite setaceous. Panicle slender, one-sided, contracted, usually rather dense and 2 to 6 in. long, with short erect branches, in small specimens reduced to 2 or 3 spikelets. Spikelets shortly pedicellate, under ½ in. long without the awns, 5- to 9-flowered. Glumes very narrow, the lowest under 2 lines without lateral nerves, the 2nd empty one 3-nerved, tapering to a point or short awn; flowering glumes obscurely nerved, about 3 lines long, tapering into a fine awn at least as long as themselves. Stamen 1 only. Grain adnate, long and narrow.—Hook. f. Fl. Tasm. ii. 127; *F. plebeia*, R. Br. Prod. 178.

Queensland. Brisbane River, *Bailey.*
N. S. Wales. Port Jackson, *Woolls.*
Victoria. Very common all over the Yarra Ridge, *F. Mueller;* Royston, *Sullivan.*
Tasmania. Table Mountain (Mount Wellington), *R. Brown;* abundant in dry pastures, etc., *J. D. Hooker;* King's Island, *M'Gowan.*
S. Australia. Round St. Vincent's Gulf, *F. Mueller.*
W. Australia. King George's Sound and neighbouring districts, *Oldfield, F. Mueller, Walcot.*

Common in the temperate regions of the northern hemisphere in the Old World and introduced into North America and some other countries. *F. myurus*, Linn., does not appear to me distinct as a species.

2. **F. duriuscula,** *Linn.; Kunth, Enum.* i. 399.—An erect perennial of 1 to 2 ft. Leaves chiefly at the base, very narrow, almost setaceous. Panicle loose but narrow, 2 to 4 in. long with few erect branches. Spikelets not numerous, erect, usually about ⅓ in. long, 4- to 6-flowered. Glumes rather rigid, the outer ones pointed, the lowest

very narrow, keeled, scarcely 2 lines long, the 2nd rather longer, 3-nerved; flowering glumes 3 lines long or rather more, faintly nerved, glabrous or pubescent, with a fine point or awn usually about 1 line long. Palea with a fine bifid point. Stamens 3.—Hook. f. Fl. Tasm. ii. 126; Reichb. Ic. Fl. Germ. t. 62.

Victoria. Barclay Ranges at an elevation of 3000 to 4000 ft., *F. Mueller.*
Tasmania. Formosa, *Gunn*; Swanport, *Story.*

One of the widely-dispersed forms of the *Sheep's Fescue* or *F. ovina*, Linn., very abundant on downs and hilly pastures of the temperate regions of both the New and the Old World.

Var. *aristata.* Spikelets rather larger with awns at least as long as the glumes.

Victoria. Ballarat, *Bacchus.*
S. Australia. Flinders and Barossa Ranges, *F. Mueller.*

* 3. **F. rigida,** *Mert. and Koch; Kunth, Enum.* i. 392.—A small rigid tufted annual, rarely above 4 or 5 in. high, with flat leaves, the ligula jagged. Panicle occupying more than half the plant, rigid and secund. Spikelets few, very shortly pedicellate on the very short branches, all turned to one side, 3 to 4 lines long, 6- to 10-flowered. Outer glumes narrow, keeled, acute; flowering ones rather above 1 line long, faintly 3-nerved, obtuse, unawned.—*Sclerochloa rigida*, Panz.; Reichb. Ic. Fl. Germ. t. 58.

S. Australia. Introduced from Europe and now common about Adelaide and Hopkins River, *F. Mueller*; Lake Bonney, *Mrs. Wehl*; Port Lincoln, *S. F. Browne.*

SUBTRIBE V. HORDEINEÆ.—Spikelets several- or 1-flowered, sessile in the alternate notches or on opposite sides of the rhachis of a simple spike, the rhachis of the spikelet usually produced beyond the upper flower into a short point or bearing an empty glume. Glumes entire, unawned or with a terminal untwisted awn.

99. AGROPYRUM, Beauv.

Spikelets several-flowered, more or less flattened, distichous and alternately sessile on the continuous or slightly notched rhachis of a simple spike, one face of the spikelet next the general rhachis, the rhachis of the spikelet more or less articulate under the flowering glumes. Glumes rounded on the back or scarcely keeled, tapering into points or awns, the flowering ones 3- to 7-nerved, the 2 outer empty ones usually shorter, narrower, 3- or rarely 1-nerved. Palea nearly as long as the glume, the 2 prominent nerves almost marginal, scabrous-ciliate. Ovary pubescent at the top. Styles short, distinct. Grain free or slightly adhering to the palea.

The genus is widely spread over the temperate regions of the globe. Of the three Australian species one is also in New Zealand, the two others appear to be endemic. The genus is usually associated with *Triticum*, founded on the cultivated wheats, which are certainly nearly allied to *Agropyrum* but, as it appears to me, still nearer so to *Ægylops*. Nees referred *A. scabrum* to the section *Vulpia* of *Festuca*, misled probably by the aspect of slender specimens reduced to a single spikelet.

Spikelets narrow, with long awns, erect and distant along the rhachis . . . . 1. *A. scabrum.*
Spikelets broad, with short points or awns, erect and close together along the rhachis . . . . 2. *A. velutinum.*
Spikelets very flat, with short points or awns, spreading or at length reflexed and not distant along the rhachis . . . . 3. *A. pectinatum.*

1. **A. scabrum,** *Beauv. Agrost.* 102.—Very variable as to stature, sometimes under 1 ft. high, slender with short filiform leaves, and from that to 3 or 4 ft. with narrow spreading flat or convolute leaves. Spike usually 6 in. to 1 ft. long, the rhachis scarcely notched. Spikelets distant, sessile, erect, ¾ to 1 in. long without the awns, narrow, 6- to 20-flowered; in the small specimens sometimes only 1 or 2 spikelets. Glumes narrow, rigid, straw-coloured, mostly about 5-nerved, not distinctly keeled, the 2 outer empty ones rather shorter tapering into short points, the flowering ones 4 to 6 lines long without the awns, tapering into fine straight or at length spreading awns mostly longer than the glumes and sometimes above 1 in. long, those of the upper and of the lower glumes often not so long as the intermediate ones. Palea obtuse.—*Festuca scabra*, Labill. Pl. Nov. Holl. i. 22, t. 26; *Triticum scabrum*, R. Br. Prod. 178; Hook. f. Fl. Tasm. ii. 128; *Vulpia rectiseta* and *V. Browniana*, Nees in Pl. Preiss. ii. 107; *V. scabra* and *V. Brauniana*, Nees in Hook. Lond. Journ. ii. 419; *Festuca rectiseta*, *F. Browniana* and *F. Billardieri*, Steud. Syn. Glum. i. 304; *Anthosachne australasica*, Steud. l. c. 237.

Queensland. Moreton Bay, *Leichhardt*, *C. Stuart*; Warwick, *Beckler*; Suttor Desert, *F. Mueller*.

N. S. Wales. Port Jackson, *R. Brown* and others and thence to the Blue Mountains and far into the interior, *Woolls*, *A. Cunningham*, *Sieber*, *Agrostotheca*, *n.* 95, and others; Lord Howe's Island, *Fullagar*.

Victoria. Wendu Vale, *Robertson*; Melbourne, Loddon, Forest Creek and many other localities, *F. Mueller* and others; Mount William, *Sullivan*.

Tasmania. Common, especially in dry and sandy places near the sea, *J. D. Hooker* and others.

S. Australia. Round St. Vincent's Gulf, *F. Mueller*, *Behr* and others.

W. Australia. King George's Sound and adjoining districts, *Oldfield*, *Walcot*, *Drummond*, *n.* 382, 383, 384.

Also in New Zealand.

A couple of specimens from Darebin Creek marked by F. Mueller var. *breviseta*, with very short awns and an irregular inflorescence, appear to have sterile very irregular spikelets and are probably hybrids.

2. **A. velutinum,** *Nees in Hook. Lond. Journ.* ii. 417.—Stems 6 in. to above 1 ft. high. Leaves chiefly at the base of the stem, flat or convolute when dry, not rigid, softly pubescent or nearly glabrous.

Spike raised on a long peduncle, 1 to 2 in. long, the rhachis pubescent and notched. Spikelets almost erect, imbricate or the lower ones distant, ovate or oblong, about ½ in. long, usually 6- to 8-flowered. Glumes 3 to 5 lines long, rigid with short almost pungent points, the outer empty ones usually 3-nerved, the flowering ones broader and 5- or rarely 7-nerved. — *Triticum velutinum*, Hook. f. Fl. Tasm. ii. 129.

Victoria. Munyong mountains and Mount Hotham, *F. Mueller.*
Tasmania. Middlesex Plains and Surrey Hills, *Gunn.*

3. **A. pectinatum,** *Beauv. Agrost.* 102.—Stems from under 1 ft. to 1½ ft. high. Leaves chiefly at the base of the stem, narrow, flat, usually hairy. Spike raised on a long peduncle, 1 to 3 in. long, the rhachis pubescent, not notched. Spikelets not very distant, spreading or at length reflexed, mostly about ½ in. long including the short points, 3- to 6-flowered. Glumes spreading, the 2 outer empty ones shorter, with only the midrib or 3-nerved; flowering glumes 4 to 5 lines long, rigid, 3- or 5-nerved, tapering into a rather long pungent point.—*Festuca pectinata*, Labill. Pl. Nov. Holl. i. 21, t. 25; F. Muell. Fragm. vi. 85; *Triticum pectinatum*, R. Br. Prod. 179; Hook. f. Fl. Tasm. ii. 129; *T. Brownei*, Kunth, Enum. i. 447; *Vulpia pectinata*, Nees in Hook. Lond. Journ. ii. 419.

N. S. Wales. Archer's Creek and Mount Royal, *Leichhardt;* Maneroo, *Herb. F. Mueller.*
Victoria. Snowy River, *F. Mueller.*
Tasmania, *Labillardière;* Hampshire Hills and Recherche Bay, *Gunn;* Southport, *C. Stuart.*

* 100. LOLIUM, Linn.

Spikelets several-flowered, singly sessile in the alternate notches on opposite sides of a simple spike, the edge of the spikelet (the backs of the glumes of one row) next the common rhachis, the rhachis of the spikelet glabrous. Glumes nearly similar, one outer one in the lateral spikelets empty and rather larger, or sometimes longer than the whole spikelet, in the terminal spikelet 2 outer ones empty.

A genus of very few species, natives of the temperate regions of the northern hemisphere, the two species introduced into Australia, found also, chiefly introduced, in other temperate or even tropical countries.

Outer glume shorter than the spikelet. Flowering glumes narrow, lanceolate, without any or with very short awns	1. *L. perenne.*
Outer glume usually as long as or longer than the spikelet. Flowering glumes oblong, some or all usually with an awn as long as or longer than themselves	2. *L. temulentum.*

* 1. **L. perenne,** *Linn.; Kunth, Enum.* i. 436.—An erect or slightly

decumbent glabrous grass of 1 to 2 ft., sometimes annual but usually lasting several years. Spike distichous, from a few inches to 1 ft. long. Spikelets at a considerable distance from each other on alternate sides of the rhachis. Outer glume of the lateral spikelets and 2 outer ones of the terminal one, empty, rigid, strongly nerved, longer than the others but much shorter than the spikelet. Flowering glumes 8 to 16 or even more, narrow, obtuse or acute, with the keel and 2 lateral nerves prominent, sometimes produced into a very short awn. In cultivation there are sometimes several outer empty glumes.—Reichb. Ic. Fl. Germ. t. 6; F. Muell. Fragm. viii. 127.

Now naturalised in several localities in **N. S. Wales, Victoria, Tasmania,** and **S. Australia,** *F. Mueller* and others.

* 2. **L. temulentum,** *Linn.; Kunth, Enum.* i. 437.—Usually taller than *L. perenne* and always annual. Outer glume of the lateral spikelets usually as long as or longer than the whole spikelet. Flowering glumes shorter and broader than in *L. perenne*, oblong, usually obtuse, with an awn as long as or longer than the glume itself. In some specimens however most of the glumes are awnless or very rarely the whole spikelet without awns.—Reichb. Ic. Fl. Germ. t. 5; F. Muell. Fragm. viii. 127.

Naturalised in **N. S. Wales, Victoria, Tasmania,** and **S. Australia,** and apparently more abundantly so than *L. perenne*, *F. Mueller* and many others.

Var. *linicola*, very slender with short few-flowered spikelets the outer glume scarcely so long as the spikelet, the awns usually rather long.—*L. linicola*, Sond. in Koch, Syn. Fl. Germ. ed. 2. 957.—Near Adelaide, *Blandowski*.

101. LEPTURUS, R. Br.

Spikelets 1-flowered or in a species not Australian 2-flowered, sessile and half embedded in the alternate notches of a more or less articulate simple spike. Outer empty glumes 2, one slightly overlapping the other on one side, or 1 only, appressed and covering the cavity, rigid and nerved. Flowering glume and palea shorter thin and hyaline, embedded in the cavity, the axis of the spikelet produced behind the palea into a minute point or bearing a small terminal empty glume. Styles short. Grain free from the glume.

A genus of few species, chiefly from the Mediterranean region, with one North American, two of the Mediterranean species extending to the sea-coasts of other parts of the Old World. Of the three Australian species two are common on the shores of the Mediterranean, the third has only been found out of Australia on the islands of the Pacific.

Annuals. Outer glumes with about 5 prominent nerves.
  Axis of the spikelet produced into a minute point or bristle.
  Outer glumes of the lateral spikelets 2 . . . . 1. *L. incurvatus*.

Outer glume of the lateral spikelets only 1 . . . . . 2. *L. cylindricus.*
Perennial. Outer glume of the lateral spikelets only 1, several-nerved. Axis of the spikelet bearing a small terminal empty glume . . . . 3. *L. repens.*

1. **L. incurvatus,** *Trin.; Kunth, Enum.* i. 462.—A tufted or branching annual of 3 in. to 1 ft. or rarely more, slender in the Australian specimens with very narrow leaves. Spikes nearly cylindrical, slender, 2 to 6 in. long straight or curved. Outer glumes 2, rigid, acute, usually 5-nerved, about 3 lines long, placed in the lateral spikelets apparently side by side outside the rest of the spikelet, but one slightly overlapping the other at the base. Flowering glume and flower embedded in the cavity of the rhachis of the spike, the rhachis of the spikelet slightly produced behind the palea into a minute point, sometimes almost obsolete. In the terminal spikelet the 2 outer glumes are normally opposed to each other.—Reichb. Ic. Fl. Germ. t. 2.

N. S. Wales. Salt Marshes, Paramatta, *Woolls.*
Victoria. Port Phillip, *F. Mueller.*

Common in the Mediterranean region, found also in some parts of East India and in New Zealand.

2. **L. cylindricus,** *Trin. Fund. Agrost.* 123.—Habit and foliage of *L. incurvatus*, in the Australian specimens usually shorter, more tufted, the leaves not quite so narrow and the spikes rather thicker and more frequently curved, but these differences are generally reversed in Mediterranean specimens. The terminal spikelet and the internal structure of the others the same in the two species, but the *L. cylindricus* has always only 1 rigid 5-nerved very pointed outer empty glume instead of the 2 of *L. incurvatus.*—*L. subulatus*, Kunth, Enum. i. 462; Reichb. Ic. Fl. Germ. t. 3.

N. S. Wales. Port Jackson (if *Monerma simplex*, Gaudich. in Freyc. Voy. Bot. 412, is correctly referred to this species.)
Victoria, Melbourne, *Adamson;* Brighton, *Herb. F. Mueller.*
W. Australia, *Drummond.*

Common in the Mediterranean, found also in South Africa.

3. **L. repens,** *R. Br. Prod.* 207.—A perennial creeping in the sands sometimes to a considerable extent, with divaricately branching stems. Leaves spreading, glaucous and glabrous or ciliate at the orifice of the sheaths. Spikes close upon the last leaf-sheath, 2 to 3 in. long, the articulate rhachis breaking much more readily than in the preceding species and therefore very rarely perfect in dried specimens. Spikelets usually about 4 lines long without the point. Outer glume closely appressed, almost embraced by the margins of the cavity, finely many-nerved, tapering into a short or long point, 2nd glume thin and hyaline, acute, concave, enclosing a palea nearly as long

and a hermaphrodite flower, the rhachis of the spikelet shortly continued at the back of the palea and bearing a small thin hyaline empty glume.—Brongn. in Duperr. Voy. Bot. 57, t. 16.

N. Australia. Arnhem N. Bay and Islands of the Gulf of Carpentaria, *R. Brown*; Port Darwin, *Schultz*, *n.* 227.
Queensland. Bird Islet, Wreck Reef, *Denham*; Raine Island, Cape York, *Challenger Expedition.*

Also in the islands of the South Pacific.

102. HORDEUM, Linn.

Spikelets 1-flowered, 3 together sessile or nearly so in the alternate notches of the rhachis of a dense cylindrical spike, the central flower (in the Australian species) hermaphrodite, those of the lateral spikelets usually male or neuter. Outer empty glumes 2, subulate or slightly flattened, tapering into straight awns or awnlike from the base. Flowering glume inserted rather higher up, convolute round the flower with a straight terminal awn. Palea 2-ribbed. Ovary crowned by a tuft of hairs. Stigmas nearly sessile.

A genus of few species, mostly of Mediterranean origin, dispersed over the temperate and subtropical regions of both hemispheres. The two Australian species are both probably introduced although one at least is now abundantly naturalised.

Outer empty glumes of the central spikelets more or less dilated and ciliate in the lower half	1. *H. murinum.*
All the outer empty glumes subulate or awnlike from the base and not ciliate	2. *H. nodosum.*

1. **H. murinum,** *Linn.; Kunth, Enum.* i. 456.—A coarse tufted or decumbent grass, varying from 6 in. to 2 ft. high. Leaves flat, the sheaths rather loose and glabrous, the lamina usually hairy. Spike dense and cylindrical, 2 to 4 in. long, thickly beset all round with the long erect rough awns. Spikelets 3 to 6 lines long without the awns, the outer empty awnlike glumes all at the base of the short rhachis forming a kind of involucre round the flowering ones, those of the central spikelet though very narrow and rigid, dilated and ciliate in the lower half, and the lowest awn of the lateral spikelets usually very slightly dilated and shortly ciliate, the 2nd subulate and scabrous only. Flowering glume usually glabrous outside, more or less ciliate inside, the ribs of the palea also ciliate. Awns varying from $\frac{1}{2}$ to 1 in. long. —Reichb. Ic. Fl. Germ. t. 11; F. Muell. Fragm. viii. 126.

Introduced and now well established in waste places in **N. S. Wales, Victoria, Tasmania, S. Australia** and **W. Australia,** *Woolls*, *F. Mueller*, *Oldfield* and others.

*2. **H. nodosum,** *Linn. Spec. Pl.* 126.—A taller and less coarse grass than *H. murinum*. Spike on a long peduncle dense and cylindrical but not so thick as in that species, 1 to 2 in. long. Outer empty glumes all very narrow, subulate or awnlike from the base and slightly scabrous not ciliate. Flowering glume and palea glabrous. Awns shorter than in *H. murinum*.—*H. pratense*, Huds.; Reichb. Ic. Fl. Germ. t. 11; *H. secalinum*, Schreb.; Trin. Spec. Gram. t. 3; F. Muell. Fragm. viii. 126.

Only known from Australia in very few specimens from **N. S. Wales Tasmania**, but said to be there established.

CLASS III. ACOTYLEDONES OR CRYPTOGAMS.

No real flowers, that is, neither stamens nor pistils nor true seeds, the reproduction carried on by means of minute often highly microscopic granules called *spores*.

The only orders here included are the higher VASCULAR CRYPTOGAMS, or Ferns and their allies, which have true stems enclosing bundles of vascular tissue, and the spores enclosed in capsule-like cases called *spore-cases* or *sporangia*. The lower Orders: Mosses, Fungi, Lichens, Algæ and their respective allies, can now scarcely be determined or studied without the aid of special works devoted to them, to condense which for the Australian Flora would be too formidable a task for me to undertake at my age. Neither is the history here entered into of the very various processes by which the spores are developed in the Orders described, or of the intermediate stages of their plant life from the spore to the perfect plant; this inquiry belongs to the domain of Vegetable Physiology, and requires the study of living individuals with the aid of works specially devoted to the subject. In Cryptogams, as in Flowering Plants, their life history can be investigated neither in field excursions nor from dried specimens, and therefore does not come into the special scope of local Floras.

ORDER. CXLV. LYCOPODIACEÆ.

Stem or rhizome bearing true leaves, either linear, or small and 1-nerved, or reduced to minute scales. Spore-cases solitary or few together, sessile in the axils of the leaves or of the bracts of a terminal spike, either all similar or of two kinds, larger ones *macrosporangia* containing a few larger spores or *macrospores*, and smaller *microsporangia*, containing numerous smaller often microscopic *microspores*, the differences now generally admitted to be sexual.

The order is spread over nearly the whole globe, and three of the Australian genera have nearly as wide a range, two others are both in the New and the Old World, chiefly tropical or southern, the remaining two extend to New Zealand, one of them being also in the Pacific Islands.

Leaves linear, on a rhizome often submerged. Spore-cases of 2 kinds, solitary in the axils or half-enclosed in the dilated bases of the leaves . . . . 1. ISOETES.

Minute plant with radical linear leaves surrounding a leafless peduncle. Spore-cases all similar, solitary within the bracts of a terminal spike . . . . 2. PHYLLOGLOSSUM.
Stems branching, with small leaves usually crowded in 4 rows. Spore-cases solitary within the bracts of terminal spikes or the upper leaves of the stem.
  Spore-cases and spores all similar . . . . 3. LYCOPODIUM.
  Spore-cases and spores of two kinds. Plants usually weaker or smaller than in *Lycopodium* . . . . . 4. SELAGINELLA.
Small floating plant with small crowded leaves. Spore-cases of 2 kinds in the axils of some of the stem-leaves . . . . 5. AZOLLA.
Stems leafy or with distant scales. Spore-cases 2 or 3 together, united into a 2- or 3-celled capsule or sorus, sessile at the base of bifid bracts or scales.
  Stems simple, leafy. Sori usually 2-celled . . . . . 6. TMESIPTERIS
  Stems dichotomous, with minute distant scales. Sori usually 3-celled. . . . . 7. PSILOTUM.

1. ISOETES, Linn.

Aquatic plants entirely submerged or rarely terrestrial in swampy or wet sandy places. Leaves linear and thick or subulate, crowded on a short thick rhizome, dilated and concave at the base, the margins of the cavity often more or less folded over the spore-cases. Spore-cases sessile at the base of the leaves, solitary, membranous, of two kinds, those of the outer leaves filled with spherical macrospores, marked with a transverse raised line, and above it 3 radiating raised lines, those of the inner leaves filled with minute powdery microspores.

A small genus having nearly the general range of the order except in hot or dry climates. It has been very carefully studied especially by Durieu and Alex. Braun, who have however multiplied the species far beyond what could be adopted on the principles laid down for the present work. They consider the Australian ones as all endemic, whilst others believe them to be all reducible to the generally spread *I. lacustris*. I have unfortunately not had the advantage of examining F. Mueller's own collections, as the parcel containing them together with the Marsileaceæ were accidently omitted to be sent to me.

Submerged plant with rather thick leaves from 2 to above 6 in. . . . . 1. *I. lacustris.*
Terrestrial or swampy plant with filiform leaves of 1 to 3 in. . . . . 2. *I. Drummondii.*

I have not seen *I. Muelleri*, A. Br. in Berl. Monatsber. 1868, 541, from Rockhampton, *O'Shanesy*, and am unable to form any opinion as to how far it differs from either of the above.

1. **I. lacustris,** *Linn.; Hook. Brit. Ferns. t.* 55.—A perennial of a bright green, forming dense tufts under the water. Leaves rather thick, linear, usually 2 to 3 in. long in calm lakes and ponds, more rarely above 6 in. in running water, their enlarged bases giving the plant a slightly bulbous aspect, the old leaves usually decaying entirely without leaving the scale-like remains characteristic of

some European species. Macrospores minutely granular-tuberculate.

Tasmania. Alpine Lakes, *Gunn*; South Esk River, *C. Stuart*.

I am quite unable to distinguish this from the species which generally inhabits Alpine lakes in the northern hemisphere, and should include in it *I. humilior*, and *I. elatior*, F. Muell.; A. Br. in Linnæa, xxv. 722; *I. tasmanica*, F. Muell.; Durieu in Bull. Soc. Bot. Fr. xi. 104; *I. Gunnii*, *I. elatior*, *I. Hookeri*, *I. Stuartii*, A. Br. in Berl. Monatsber. 1868, 535 to 539, of all of which I have seen specimens which I believe to be authentic. One character insisted upon, that of the degree in which the margins of the cavity of the leaf cover the spore-case, seems to me to depend much on the degree of development of the fructification.

2. **I. Drummondii,** *A. Br. in Berl. Monatsber.* 1863, 593, 1868, 542.—A much smaller plant than *I. lacustris*, with very slender or filiform leaves 1 to 3 in. long, their dilated bases short and very broad, appearing whitish when dry, giving a very bulbous aspect to the plant. These differences and the more general presence of stomata may however be due to the more terrestrial station of the plant. The macrospores appear to me to be very similar to those of *I. lacustris*. —*I. tripus*, A. Br. l. c. 1863, 559, 1868, 544; *I phæospora*, Dur. in Bull. Soc. Bot. Fr. xi. 103.

W. Australia, *Drummond n.* 989, 990.

2. PHYLLOGLOSSUM, Kunze.

Small stemless plant, with a tuberous rootstock and radical leaves and peduncles. Spore-cases reniform, 2-celled, 2-valved, sessile in the axil of the bracts of a pedunculate spike, filled with minute powdery spores.

The genus is limited to the single Australian species which is also in New Zealand.

1. **P. Drummondii,** *Kunze in Bot. Zeit.* 1843, 721.—Rootstock small, with a few fibrous roots, producing an ovoid tuber annually renewed as in *Orchis*, so that at the time of fruiting there are generally two present. Leaves few, linear, ¼ to ½ in. long, in a radical tuft. Peduncle usually about twice as long, bearing an erect cylindrical spike of 2 to 3 lines. Bracts broad, with an erect point, shortly exceeding the spore-cases.—Hook. Ic. Pl. t. 908; Hook. f. Fl. Tasm. ii. 154; Metten. in Bot. Zeit. 1867, 97, with a fig.; *Lycopodium sanguisorba*, Spring, Monogr. Lycopod. ii. 36.

Victoria. Damp places, Melbourne, *Adamson*; Portland, *Allitt*; near Dandenong and Malacotta Inlet, Gipps' Land, *F. Mueller*.
Tasmania. George Town, *Gunn*.
W. Australia, *Drummond*, *n.* 993; West End of Stirling Range. *F. Mueller*.

3. LYCOPODIUM, Linn.

Stems leafy, hard, branching, creeping prostrate or erect. Leaves small, entire or minutely serrate, inserted all round the stem, usually in 4 rows. Spore-cases all of one kind, flattened, 1-celled, 2-valved, sessile in the axils of the upper leaves, or of bracts usually smaller or broader than the stem-leaves and forming terminal or lateral spikes. Spores all minute and powdery.

The genus is widely spread over every part of the globe. Of the eleven Australian species, three are generally distributed in the New and the Old World, one limited to the Old World, the seven others are in New Zealand, five of them extending to the Pacific Islands and two to South America.

Leaves lanceolate, cartilaginous, crowded all round the stem, mostly 3 to 6 lines long.	
Stems short, erect. Spore-cases in the axils of the upper leaves	1. *L. selago.*
Stems elongated, ascending. Spikes terminal, usually several. Bracts smaller than the stem-leaves but much longer than the spore-cases	2. *L. varium.*
Stems elongated, pendulous. Spikes terminal, several. Bracts scarcely exceeding the spore-cases	3. *L. phlegmaria.*
Leaves usually narrow, crowded round the stem, under 3 lines long. Spore-cases in spikes, with small broad bracts.	
Spikes pedunculate.	
Stems extensively creeping with numerous ascending leafy branches. Spikes terminal	4. *L. clavatum.*
Stems creeping, short or scarcely branched. Spikes single on lateral erect peduncles bearing small leaves	5. *L. carolinianum.*
Spikes sessile, lateral.	
Stems branched at the base, elongated and slender. Leaves subulate	6. *L. laterale.*
Stems diffuse, and much branched. Leaves linear . .	7. *L. diffusum.*
Spikes sessile, terminal, usually short. Stems often above 2 ft. long.	
Branches numerous, spreading or flexuose. Spikes nodding	8. *L. cernuum.*
Stems and branches erect, dense. Spikes erect . . .	9. *L. densum.*

(See also the first two species of SELAGINELLA.)

Leaves distichous and decumbent in 2 opposite rows, with smaller adnate ones resembling stipules. Spikes sessile, terminal or paniculate.	
Distichous leaves broadly lanceolate. Bracts with spreading tips	10. *L. scariosum.*
Distichous leaves narrow-lanceolate. Bracts with appressed tips scarcely exceeding the spore-cases . .	11. *L. volubile.*

(Most species of SELAGINELLA have the foliage of the last two species, but are more delicate and diffuse besides the difference in the spore-cases.)

1. **L. selago,** *Linn.; Spring, Monogr. Lycop.* i. 19, ii. 5.—Stems scarcely creeping, though slightly decumbent and rooting at the base, the forked erect branches forming dense level-topped tufts 3 to 6 in. high, completely covered with their crowded but spreading dark-green leaves, all lanceolate, 3 to 4 lines long, with a short fine point. Spore-cases in the axils of the upper leaves, not forming a distinct spike, the leaves or bracts being quite similar to the stem-leaves.—Hook. f. Fl. Tasm. ii. 155. t. 170; Hook. Brit. Ferns, t. 84.

Victoria. Mount Baw-Baw at an elevation of 4000 ft. and Munyong Mountains up to 6000 or 7000 ft. *F. Mueller.*

Tasmania. Mount Wellington, *J. D. Hooker, Gulliver;* Mount Field East, *F. Mueller.*

In most cool mountainous alpine or arctic regions both of the northern and southern hemispheres. The Australian specimens form generally rather longer and looser tufts than the European ones, with some approach to some states of *L. varium*, a tendency not observed in northern specimens.

2. **L. varium,** *R. Br. Prod.* 165.—A variable species, some of the smaller more compact specimens approaching *L. selago*, but usually decumbent or elongated and rooting at the base, with ascending branches of 6 in. to 1 ft. Leaves crowded all round the stem, lanceolate, obtuse, spreading or rarely erect, 3 or 4 lines or sometimes nearly ½ in. long. Spikes terminal, 1 to 4 in. long, solitary or 2 or 3 together, continuous with the leafy branch with bracts sometimes leafy 2 to 3 lines long, in other specimens short broad obtuse, imbricate in 4 rows, and 1 to 2 lines long, almost as in *L. phlegmaria*, or small and acuminate approaching those of the New Zealand *L. Billardieri*, Spring, and thus almost connecting these species.—Spring. Monogr. Lycopod. i. 57, ii. 24; Hook. and Grev. Ic. Filic. t. 112; Hook. f. Fl. Tasm. ii. 155, t. 170; *L. selago, var.* F. Muell. Fragm. v. 111.

N. S. Wales. Lord Howe's Island, *C. Moore.*

Victoria. Genoa Peak and Munyong Mountains, *F. Mueller.*

Tasmania. Table Mountain (Mount Wellington), *R. Brown;* abundant on the ground and trunks of trees, *J. D. Hooker.*

Also in New Zealand, the Pacific Islands and South Africa.

3. **L. phlegmaria,** *Linn.; Spring. Monogr. Lycop.* i. 63, ii. 28.—Stems elongated, usually pendulous from rocks or trunks of trees. Leaves crowded, cartilaginous, spreading, mostly lanceolate and 3 to 6 lines long, but occasionally oblong and obtuse. Spikes slender at the ends of the branches, usually several and often forked, 2 to 3 or even to 6 in. long. Bracts imbricate in 4 rows, usually broad and scarcely exceeding the spore-cases, but in some specimens with a lanceolate point twice as long.

Queensland. Rockingham Bay, *Dallachy;* Daintree River, *Fitzalan.*

Widely spread over tropical Africa and Asia.

4. **L. clavatum,** *Linn.; var.* fastigiatum. — Stems from a long creeping leafless base or rhizome, procumbent, leafy, ascending to a few inches, or rarely above 6 in. in the Australian specimens. Leaves crowded, linear or linear-lanceolate, rarely above 2 lines long, acute but without the hairlike point of the common European form. Spikes terminal, erect, more or less pedunculate, ½ to 2 in. long. Bracts closely imbricate, lanceolate, acuminate, with fine usually spreading tips.—*L. fastigiatum,* R. Br. Prod. 165; *L. diffusum,* Spring, Monogr. Lycop. ii. 39, not of R. Br.; *L. clavatum,* var. *magellanicum,* Hook. f. Fl. Tasm. ii. 157.

Victoria. Snowy River, Maroka Valley, Mount Useful, *F. Mueller.*

Tasmania. Derwent River, *R. Brown;* moist boggy subalpine places abundant, *J. D. Hooker;* Mount Wellington and Mount Field East, *F. Mueller.*

5. **L. carolinianum,** *Linn.; Spring, Monogr. Lycop.* i. 98, ii. 46.—Stems leafy but creeping and rooting like rhizomes, with very short or scarcely any ascending barren branches. Leaves crowded, narrow lanceolate, acuminate, not above 2 lines long in the Australian specimens, two rows often rather longer and more spreading than the other two. Fertile branches (often called peduncles) erect, 1 to 6 in. high including the spike, with small loosely erect leaves, the spike or fruiting part terminal or sometimes below the end. Bracts small, subulate-acuminate and spreading from a broad base, often but not always minutely serrulate-ciliate.—Hook. f. Fl. Tasm. ii. 170; F. Muell. Fragm. v. 111.

Queensland. Moreton Island, *F. Mueller.*

Tasmania. Boggy places, not uncommon, *J. D. Hooker.*

W. Australia, *Drummond, n.* 351; Albany, *Preiss, n.* 1881. These specimens are very small with short branching creeping stems, the fruiting branches 1-2 in. long, and are distinguished as *L. serpentinum,* Kunze. in Pl. Preiss. ii. 108, or as *L. Drummondii,* Spring, Monogr. ii. 35, as having the stemleaves all similar instead of the lateral rows being longer and more spreading, but the character is variable in the typical North American specimens.

The species extends over North and South America, tropical and southern Africa, Ceylon and New Zealand.

6. **L. laterale,** *R. Br. Prod.* 165.—Stems leafy from the base, prostrate decumbent or ascending, slightly branched, from a few inches to 2 feet long. Leaves crowded all round, lanceolate-subulate, 2 to 3 lines long. Spikes few, lateral and sessile, mostly about ½ in. long. Bracts small, from a very broad base shortly acuminate, usually brown-coloured.—Spring, Monogr. Lycop. i. 82, ii. 38; Labill. Sert. Austr. Caled. t. 15; Sieb. Syn. Filic. n. 84.

Queensland. Rockingham Bay, *Dallachy;* Moreton Island, *F. Mueller.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, A. Cunningham, Woolls.*

Victoria. Near Brighton, Bunip Creek, Mount Abrupt, *F. Mueller;* Grampians, *Wilhelmi, Sullivan.*

Also in New Caledonia and New Zealand.

7. **L. diffusum,** *R. Br. Prod.* 165.—Very near *L. laterale* to

which Hook. f. Fl. Tasm. ii. 156, refers it as a variety, but a much smaller, more rigid plant, the procumbent stems more branched and very shortly ascending. Leaves linear, acute or almost obtuse, rarely above 2 lines long, spreading or almost imbricate. Spikes of *L. laterale*, usually brown, lateral, sessile or scarcely pedunculate.

Victoria. Grampians, *Dalton.*

Tasmania. Port de Lesperance, *R. Brown*; Alpine Bogs, Lake St. Clair, etc. *Gunn*; Macquarrie Harbour, *Milligan*; near Circular Head, *F. Mueller.*

8. **L. cernuum,** *Linn.*; *Spring, Monogr. Lycop.* i. 79, ii. 37.—Stems hard, rising to 2 ft. or when very luxuriant to 5 or 6 ft. in height, with numerous spreading flexuose repeatedly forked branches. Leaves spreading all round the stem, fine, subulate, incurved, 1 to 2 lines long. Spikes sessile above the last leaves, nodding, 2 to 3 lines long. Bracts ovate-lanceolate, ciliate, imbricate in 8 rows, longer than the spore-cases.

N. Australia. Upper Victoria River, *F. Mueller.*

Queensland. Rockingham Bay, *Dallachy*; Daintree River, *Fitzalan*; Bowen, *Woolls.*

Common throughout the tropics in the New as well as the Old World.

9. **L. densum,** *Labill. Pl. Nov. Holl.* ii. 104, *t.* 251.—Stems from a short creeping base, erect, rigid, usually 1 to 1½ but sometimes 2 to 4 ft. high, very densely branched in the upper part. Leaves crowded all round, those of the main stem lanceolate with scarious tips and often 2 lines long, those of the branches imbricate and scarcely 1 line long. Spikes numerous, terminal, erect and sessile, from under ½ in. to 1 in. long. Bracts ovate-lanceolate, with spreading tips often scarious on the margins.—R. Br. Prod. 165; Spring, Monogr. Lycop. i. 86, ii. 40; Hook. f. Fl. Tasm. ii. 156; F. Muell. v. 111; Sieb. Syn. Filic. n. 82.

N. S. Wales. Port Jackson, *R. Brown, A. Cunningham, Fraser*; New England, *C. Stuart.*

Victoria. Grampians, *Sullivan*; Mount Cobberas, *Imlay*; Upper Yarra River, *F. Mueller*; Cape Howe, *Walter.*

Tasmania, *Labillardière*; Derwent River and Port Dalrymple, *R. Brown*; abundant in heathy places throughout the island, *J. D. Hooker.*

Also in New Zealand and Norfolk Island.

10. **L. scariosum,** *Forst.*; *Spring, Monogr. Lycop.* i. 108, ii. 49.—Stems prostrate or creeping sometimes to a great length, with numerous shortly ascending branches. Leaves distichously spreading, oblong or lanceolate, acute, decurrent, about 2 lines long, with small appressed stipule-like ones between the two rows. Spikes sessile, usually terminal, about ½ in. long. Bracts in 4 rows, broad, with spreading tips scarious on the margin.—Hook. Ic. Pl. t. 966; Hook. f. Fl. Tasm. ii. 157; *L. decurrens*, R. Br. Prod. 165.

Victoria. Mount Baw-Baw, and sources of the Yarra, *F. Mueller.*

Tasmania. Table Mountain (Mount Wellington), *R. Brown*, *Gunn*; common on the mountains in boggy places, *J. D. Hooker*.

Also in New Zealand and in Antarctic America.

11. **L. volubile,** *Forst.*; *Spring*, *Monogr. Lycop.* i. 105, ii. 49.—Stems slender, wiry, flexuose, climbing to a great extent, with few narrow appressed leaves, but emitting numerous leafy branches, with two rows of distichously spreading leaves as in *L. scariosum*, but much narrower, falcate, decurrent, smooth and shining, with mucronate tips, the small appressed leaves as in *L. scariosum*. Spikes when present numerous, sessile at the ends of the branches, ½ to 1½ in. long, slender. Bracts broad, closely imbricate, shortly acuminate but without spreading tips.—Hook. and Grev. Ic. Filic. t. 170.

N. Australia. Glenelg River, *Martin*. A single specimen without fructification, but evidently belonging to this species, which is in Java as well as in New Zealand and the Sandwich Islands. Spring gives also the station King George's Sound, *Quoy in herb. Webb*, but this is probably a mistake.

4. SELAGINELLA, Spring.

Stems leafy, usually much branched, more slender or smaller than in *Lycopodium*. Leaves small, entire or minutely serrate, inserted all round the stem but in four rows. Spore-cases of two kinds, small ones filled with minute, powdery spores called *microspores*, and larger containing 1 to 6 larger spores called *macrospores*, all opening in 2 to 4 valves and sessile in the axils of bracts in terminal spikes.

The genus has the same wide range as *Lycopodium*. Of the five Australian species three extend into tropical Asia, or at least into the Malayan Archipelago, and one of them is also in America, two others appear to be endemic, but the species have in many instances been so multiplied by monographists that the exact limits of the really distinct ones cannot be given without a careful revision of the whole genus. The generic character, the presence of two kinds of spores, is probably constant, but requires a close observation to verify it. The habit however generally suffices to distinguish it from *Lycopodium*, although the first two of our species have the foliage of *Lycopodium* (but smaller) and the last two of *Lycopodium* have that of *Selaginella*.

Small erect plants. Stem-leaves all similar. Spikes slender, the bracts imbricate in 4 rows.	
Stems from a branching base, simple, about 1 in. long .	1. *S. Preissiana.*
Stems branching upwards, 2 to 6 in. or sometimes more .	2. *S. uliginosa.*
Stem-leaves in two outer rows distichous and spreading, 2 inner rows closely appressed. Spikes slender, the bracts imbricate in 4 rows.	
Stems bare at the base, ascending or erect, very much branched upwards to a length and breadth of 6 to 10 in. (in outline)	3. *S. flabellatum.*
Stems diffuse or creeping and much branched	4. *S. concinna.*
Stem-leaves and habit of *S. concinna* or much smaller. Spike oblong, the bracts spreading, nearly resembling the stem-leaves	5. *S. Belangeri.*

1. **S. Preissiana,** *Spring*, *Monogr. Lycop.* ii. 61.—An erect slender annual of 1 to 2 in., divided at the base into simple or once forked

branches leafy throughout. Leaves all similar, spreading, very narrow, acuminate, ⅓ to ¾ line long. Spikes occupying usually the greater part of the plant. Bracts the length of the stem-leaves, acute or acuminate, imbricate in 4 rows. — F. Muell. Fragm. v. 112; *Lycopodium gracillimum*, Kunze in Pl. Preiss. ii. 109.

Victoria. Fitzroy River, *Robertson;* Grampians, *Sullivan;* Dandenong Ranges and mountains of Snowy River, Gipps' Land, *F. Mueller;* Ararat, *Green.*

Tasmania. South Esk River, *C. Stuart.*

W. Australia. Swan River, *Drummond, Preiss, n.* 1882; Blackwood River, *Oldfield.*

2. **S. uliginosa,** *Spring, Monogr. Lycop.* ii. 60.—Stems from a creeping base erect or ascending, slender but rigid, branching and leafy throughout, usually 2 to 6 in. long but occasionally much drawn up. Leaves all similar or nearly so, ovate-lanceolate, acute, keeled, spreading or at length reflexed, sometimes oblique but not vertical. Spikes terminal, slender, from 3 or 4 lines to 1 in. long. Bracts smaller narrower and more acute than the stem-leaves, imbricate in 4 rows, the points appressed or slightly spreading.—Hook. f. Fl. Tasm. ii. 158; F. Muell. Fragm. v. 112; *Lycopodium uliginosum*, Labill. Pl. Nov. Holl. ii. 104, t. 251; R. Br. Prod. 165; Sieb. Syn. Filic. n. 83.

Queensland. Stradbrooke Island, *W. Hill.*

N. S. Wales. Port Jackson to the Blue Mountains, *A. Cunningham, J. D. Hooker* and others; New England, *C. Stuart;* Clarence River, *Wilcox;* Macleay River, *Heriot;* Richmond River, *Mrs. Hodgkinson;* Lord Howe's Island, *C. Moore.*

Victoria. Port Phillip, *R. Brown, Adamson, F. Mueller;* Portland, *Allitt;* Grampians, *Sullivan;* Dandenong Ranges and Gipps' Land, *F. Mueller;* Cape Howe, *Walter.*

Tasmania, *Gunn;* probably common in marshy places, *J. D. Hooker;* Bass's Straits, *Milne.*

3. **S. flabellata,** *Spring, Monogr. Lycop.* ii. 174.—Rhizome creeping and rooting to a great extent, emitting erect leafy stems, simple for 2 to 4 in., then expanding into a broadly ovate form, 6 to 10 in. long and sometimes nearly as wide, densely branched. Leaves in 4 rows, the 2 outer rows distichously spreading, nearly vertical, falcate, 1 to 1½ lines long, usually dark green on the upper side, pale and shining underneath in the dried state, inner rows not half so long, semicordate, fine pointed, converging over the rhachis. Spikes 3 to 9 lines long, slender. Bracts keeled, fine-pointed, imbricate in 4 rows.—*Lycopodium flabellatum*, Linn.

Queensland. Rockingham Bay, *Dallachy;* Daintree River, *Fitzalan.*

Also in the Malayan Archipelago to South China and in tropical America. The species probably includes *S. argentea*, Spring, and some others.

4. **S. concinna,** *Spring, Monogr. Lycop.* ii. 199.—Stems slender, creeping, pinnately branched and leafy throughout, the numerous intricate branches shortly ascending. Larger leaves in two rows, distichously spreading, oblong, obtuse or acute, 1 to 1⅓ lines long

scarcely cordate at the base; inner rows smaller, ovate, appressed. Spikes terminal, 4 to 8 lines long, about 1 line diameter. Bracts keeled, acuminate, imbricate in 4 rows, the tips usually spreading.—*Lycopodium concinnum*, Swartz.

Queensland. Rockingham Bay, *Dallachy;* Daintree River, *Fitzalan;* York Peninsula, *N. Taylor.*

Also in East India and the Mascarene Islands.

5. **S. Belangeri,** *Spring, Monogr. Lycop.* ii. 242.—Stems creeping, pinnately branched, leafy throughout as in *L. concinna,* but a smaller more delicate plant rarely 6 in. and often under 1 in. long. Larger leaves in 2 rows, distichously spreading, scarcely 1 line long, ovate; 2 inner rows appressed, rather smaller. Spikes terminal, oblong, rarely above 6 lines long, 2 lines broad in the larger specimens, the spreading bracts very similar to the larger stem-leaves.—*Lycopodium Belangeri,* Bory in Belang. Voy. Bot. 12, t. 1, f. 2.

N. Australia. Port Darwin, *Schultz, n.* 111, 315; Etheridge River, *Gulliver.*
Queensland. Rockingham Bay, *Dallachy*; York Peninsula, *N. Taylor.*

Lycopodium pumilio, R. Br. Prod. 166 (*Selaginella pumilio,* Spring, Monogr. Lycop. ii. 241), is founded upon 2 minute specimens which had been mixed with some other dwarf plants in Banks and Solander's Endeavour River collection, they are both quite simple with a single fibre to the root, one ½ in. high, the other very little longer though in fruit. They appear to be small starved specimens fruiting the first year, perhaps of *S. Belangeri,* although the bracts are much smaller than in that species more like those of the Ceylonese *L. ciliare,* Retz, but some of Schultz's specimens of *S. Belangeri* have the bracts as small on the side branches. R. Brown also in Herb. Banks refers to *S. pumilio* some nearly allied dwarf specimens from South Africa.

5. AZOLLA, Linn.

Small floating plants, with branching and rooting leafy stems. Leaves small, imbricate, unequally 2-lobed. Spore-cases in pairs, sessile in the axils of the leaves on the main branches, one a globular membranous sac enclosing a cluster of small globular pedicellate spores (or sporangia), the other smaller, ovoid, containing a single macrospore surrounded at the base by 2, 4 or more corpuscles, called by some antheroids, by others abortive spores.

A genus of few species, dispersed over the tropical, the northern subtropical and southern cooler regions of the globe. Of the two Australian species one is also Asiatic and African, the other extends only to New Zealand. The affinities of the genus have been variously given according to the interpretation of the parts of fructification. It is certainly not closely allied to any one, but appears to me to be much nearer to *Selaginella* than to Marsileaceæ. I have not had F. Mueller's specimens of this genus.

Branches of the stem linear and regularly pinnate . . . . 1. *A. pinnata.*
Branches of the stem with the leaves shortly obovate . . . 2. *A. rubra.*

1. **A. pinnata,** *R. Br. in Flind. Voy.* ii. 611, *t.* 10, *Prod.* 167.—Stems ones or twice pinnate, broadly ovate in outline, with linear leafy

branches, each plant under 1 in. long but generally collected in large masses on the surface of the water, emitting numerous rootlets, at first entire and sometimes dilated and flat, the older ones elegantly feathery. Leaves ovate, obtuse, concave, regularly but loosely imbricate, the upper lobe of each leaf about ½ line long, the lower lobe smaller. Larger spore-cases when full grown globular, reddish, nearly 1 line diameter, the smaller ones oblong, about ¼ line long, with usually 4 corpuscles at the base of the macrospore.—Griff. in Calcutta Journ. Nat. Hist. v. 257, t. 15 to 17; Metten. in Linnæa, xx. 273, t. 3.

N. S. Wales, *Fraser;* Paterson's and Richmond Rivers, *R. Brown.*
Victoria. Goulburn River, *F. Mueller.*

Dispersed over tropical Asia and Africa.

2. **A. rubra,** *R. Br. Prod.* 167.—Individual plants smaller more compact and broader than in *A. pinnata*, the branches short, with fewer closely imbricate but spreading leaves, the roots all simple in Brown's as well as our own specimens. Larger spore-cases globular, about ½ line diameter, the smaller oblong ones scarcely ¼ line, the structure otherwise the same as in *A. pinnata.*—Hook. f. Fl. Tasm. ii. 158.

Queensland. Brisbane River, *F. Mueller.*
N. S. Wales. Paterson's River, *R. Brown.*
Victoria. Wendu River, *Robertson;* Melbourne, *Adamson;* Avon River, *F. Mueller.*
Tasmania. Floating on marshes and ponds, *Gunn.*
S. Australia. Murray River, *Behr.*

Also in New Zealand.

6. TMESIPTERIS, Bernh.

Stems simple, leafy. Leaves vertical, sessile and decurrent, entire, intermixed with leafy bracts bipartite on a short petiole. Spore-cases usually two together, united into a capsule-like sorus, sessile on the petiole of the bracts, transversely oblong, flattened, 2-celled and didymous or 2-lobed, opening loculicidally in 2 valves. Spores minute, uniform.

The genus is limited to a single species found also in New Zealand and the Pacific Islands.

1. **T. tannensis,** *Bernh. in Schrad. Journ.* 1800, ii. 131, *t.* 2, *f.* 5. —Stems from a creeping slender rootstock ascending or pendulous, 6 in. to 1 ft. long. Leaves obliquely oblong or narrow lanceolate, usually about ½ in. long but sometimes nearly 1 in., truncate obtuse or acute at the end, the lower margin shortly decurrent, the single central nerve often produced at the end into a fine point. Bracts rather shorter than the leaves and occasionally replacing them in the upper part of the stem, deeply divided into 2 segments like the leaves

but smaller and more acute. Capsule-like sori about 2 lines broad and 1 line long, much compressed, parallel to the petiole.—Labill. Pl. Nov. Holl. ii. 105, t. 252; F. Muell. Fragm. v. 112; *Lycopodium tannense*, Spreng. in Schrad. Journ. 1799, ii. 267; *Psilotum truncatum*, R. Br. Prod. 164; *Psilotum Forsteri*, Endl. Iconogr. t. 85; *Tmesipteris truncata*, Desv. in Ann. Soc. Linn. Par. vi. 192; Hook. Gen. Filic. t. 86; *T. Forsteri*, Endl. Prod. Fl. Norf. 6; Spring, Monogr. Lycop. 265; Hook. f. Fl. Tasm. ii. 155; *T. Billardieri*, Endl. l. c. 6; Spring, l.c. 266.

Queensland. Bellender Ker Range and Mount Lindsay, *W. Hill;* Rockingham Bay, *Dallachy*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *A. Cunningham* and others; New England, *C. Stuart;* Clarence River, *Wilcox;* Illawarra, *Johnson;* Lord Howe's Island, *C. Moore*.

Victoria. Yarra and Dandenong Ranges, Sealer's Cove, Gipps' Land, *F. Mueller*.

Tasmania. Derwent River, *R. Brown;* Not uncommon hanging from rocks and trunks of trees, *J. D. Hooker*, also on moist banks, *A. Cunningham*.

Sprengel's specific name *tannensis* has been discarded by some botanists because Forster's specimens in the British Museum are marked as from New Zealand and not from Tanna, and are probably those designated in Forster's Prodromus as *Osmunda obtusa*, Soland., from New Zealand, but there is every reason to believe that the plant grows in Tanna as it does in several other islands of the Pacific, and Sprengel positively states that Forster's specimen in his herbarium was from that island. The Californian station given on the authority of two specimens in Herb. Hook. from Douglas, has probably arisen from some accident in sorting specimens, for it has not been found in N. W. America by any subsequent collector. The South Australian station given by Spring originates in another error, he having mistaken Kangaroo Bottom (Tasmania) for Kangaroo Island.

F. Mueller observes that the capsules (capsule-like sori) are occasionally though very rarely 3-celled, which would justify the restoring the species to *Psilotum* where Brown had placed it, were it not that the habit were so totally different.

7. PSILOTUM, Swartz.

Stems dichotomous, with distant notches bearing minute scalelike leaves, sometimes scarcely prominent, occasionally replaced by equally minute bifid bracts Spore-cases usually 3 together, united in a capsule-like sorus, sessile in the axil of or attached to the bracts, nearly globular, 3-lobed, 3-celled, opening loculicidally in 3-valves. Spores minute, uniform.

A small tropical and subtropical genus common to the New and the Old World. Both the Australian species have a wide range in America and Asia, but perhaps one only in Africa.

Branches, at least the fertile ones angular . . . . . . 1. *P. triquetrum.*
Branches all flat . . . . 2. *P. complanatum.*

1. **P. triquetrum,** *Swartz; Spring, Monogr. Lycopod.* ii. 269.—

Rhizome short, intricately branched. Stems erect or pendulous when on trees, from 3 or 4 in. to above 1 ft. long, repeatedly dichotomous in the upper part, the fertile branches 3-angled, the barren ones usually flattened. Scale-like leaves minute and subulate, the bracts subtending the spore-cases equally small and distant but forked. Capsule-like sori globular, about 1 line diameter, attached to the bract below the fork.—R. Br. Prod. 164; Hook. Gen. Filic. t. 87, Filic. Exot. t. 63.

Queensland. Rockingham Bay, *Dallachy;* Rockhampton and neighbourhood, *Bowman*, *O'Shanesy;* Moreton Bay and other localities in South Queensland, *W. Hill*, *F. Mueller* and others.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *A. Cunningham* and many others; New England, *C. Stuart;* Macleay River, *Fitzgerald;* Richmond River, *Mrs. Hodgkinson;* Lord Howe's Island, *C. Moore*, *Fitzgerald.*

In most tropical or subtropical moist regions in the New and the Old World, more rare in Africa.

2. **P. complanatum,** *Swartz; Spring, Monogr. Lycop.* ii. 271.—Stems dichotomous as in *P. triquetrum*, but usually longer and looser and the fruiting branches as well as the whole stem flat, varying from 1 to 2 lines broad, rigid or flaccid, the margins alternately notched. Leaves and bracts very minute or almost obsolete. Capsule-like sori smaller than in *P. triquetrum.*—*P. flaccidum*, Spring, l. c.

Queensland. Rockingham Bay, *Dallachy;* Bowen, *Woolls.*

Also in tropical Asia and America, the Mascarene and Pacific Islands.

ORDER CXLVI. MARSILEACEÆ.

No true leaves. Fronds as in Filices proceeding from the rhizome and rolled inwards (circinate) at the top when young; barren ones either reduced to a linear stipes or bearing a leaf-like lamina divided into 4 digitate leaflets; fertile fronds on a shorter stipes or nearly sessile, the lamina recurved with the margins united, forming an ovoid or globular utricle usually called an *involucre.* Spore-cases of two kinds as in some Lycopodiaceæ, but arranged as in Filices in sori inside the involucre (*i.e.* on the under surface of the recurved frond), each sorus enclosed in a membranous indusium, apparently dividing the involucre into as many cells.

The Order is limited to the two Australian genera, both of which have a wide range in the New as well as the Old World. They might well be regarded as forming a tribe of Filices, to which they are much more closely allied than to Lycopodiaceæ, with some genera of which they have been frequently associated. I have not seen F. Mueller's collections of this order, but the Kew Herbarium contains authentic specimens of most of A. Braun's species.

Barren fronds with a 4-foliolate lamina. Sori several often numerous, on transverse veins within the involucre . . . 1. MARSILEA.
Barren fronds linear. Sori 4, vertical, their indusia dividing the globular involucre into 4 cells. Aquatic plant . . . . . 2. PILULARIA.

1. MARSILEA, Linn.

Rhizome creeping and rooting at the nodes. Barren fronds with a long petiole or stipes, the lamina divided into 4 digitate leaflets, with numerous forked veins radiating from their base. Involucres sessile or stipitate, their stipes often but not always combined at the base with those of the barren fronds as in Ophioglosseæ. Sori linear, on transverse veins proceeding from the upper side or midrib of the involucre, the indusia often more or less combined, dividing the involucre into 2 series of transverse cells. Each sorus consisting of few macrosporangia, each one surrounded by several microsporangia.

The genus has a wide range in the northern hemisphere and one of the Australian species does not appear to be distinct from the common northern one. The others are probably endemic.

Whole plant glabrous. Leaflets obovate. Involucres on stipes not exceeding ½ in. and often very short . . .	1. *M. quadrifolia.*
Leaflets narrow-oblong. Involucres hirsute, sessile or nearly so	2. *M. angustifolia.*
Leaflets obovate usually hirsute. Involucres hirsute, sessile or nearly so	3. *M. hirsuta.*
Leaflets obovate, often crenate; silky-villous underneath. Involucres on stipes of 1 to nearly 2 in.	4. *M. Drummondii.*

1. **M. quadrifolia,** *Linn.*; *R. Br. Prod.* 167.—Whole plant quite glabrous. Leaflets on a long stipes, very broadly obovate, quite entire. Involucres obliquely ovoid or almost globular, 2 to 3 lines long, mostly in clusters of 2, 3 or rarely 4, the stipes or peduncles not exceeding ½ in. and often shorter, more or less united at the base and very shortly so with the base of the stipes of the barren frond.—A. Br. in Berl. Monatsber. 1870, 724; *M. Brownii,* A. Br. l. c. 725.

N. S. Wales. Port Jackson, *R. Brown.*

I can find no difference between these and European specimens except that the stipes of the involucres are usually but not always rather longer and almost but not quite free from that of the barren frond.

2. **M. angustifolia,** *R. Br. Prod.* 167.—Leaflets narrow-oblong, very obtuse truncate or slightly toothed at the end, the stipes slender, filiform, 2 to 3 in. long in Brown's specimens, above 1 ft. in F. Mueller's, glabrous or nearly so. Involucres hirsute and nearly sessile as in *M. hirsuta,* but in the few specimens seen solitary at the nodes.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; Victoria River, *F. Mueller.*

3. **M. hirsuta,** *R. Br. Prod.* 167.—Young ends of the rhizome densely rusty-villous. Leaflets obovate or broadly cuneate, sparingly or densely hirsute underneath, the stipes usually long and slender. Involucres small, usually clustered, sessile at the base of the barren fronds or on a stipes shorter than the involucre.—A Br. in Berl. Monatsber. 1870, 732.

N. Australia. Islands of the Gulf of Carpentaria, *R. Brown*; Victoria River, *F. Mueller.*

Queensland. Broad Sound, *R. Brown;* Brisbane River, Moreton Bay, *F. Mueller;* South Queensland, *Hartmann.*

N. S Wales. Port Jackson, *R. Brown.*

Victoria? Ballarat, *Bacchus.* The specimens not in fruit and therefore doubtful.

A. Braun had distinguished some small-leaved specimens as a variety which he afterwards published as a species, *M. exarata,* A. Br. in Berl. Monatsber. 1870, 732. Some specimens show both large and small leaflets.

4. **M. Drummondii,** *A. Br. in Linnæa,* xxv. 721.—Ends of the rhizome under side of the leaflets and involucres more or less silky-hairy. Stipes of the barren fronds usually long and slender; leaflets broadly obovate-cuneate or fan-shaped, more or less crenate or shortly lobed or rarely quite entire. Involucres larger than in any of the foregoing species, the stipes or peduncles clustered, free from the base, 1 to 1½ or rarely 2 in. long.—*M. Muelleri,* A. Br. in Linnæa, xxv. 721; *M. macropus,* Hook. Ic. Pl. t. 909, Gard. Ferns, t. 63.

N. S. Wales, Victoria, S. Australia and **W. Australia,** ranging over the whole desert interior, the involucres known as a miserable article of food under the name of *Nardoo.* Gathered by numerous cultivators and cultivated in the Berlin Garden (*Drummond, n.* 398).

A. Braun had in the Kew and other herbaria distinguished several varieties upon characters which I fail to appreciate, although he afterwards raised them into ten distinct species, *M. Howittiana, M. sericea, M. Muelleri, M. macra, M. oxaloides, M. hirsutissima, M. Nardu, M. Drummondii, M. salvatrix* and *M. elata,* A. Br. in Berl. Monastber. 1870, 734 to 739. The two minute protuberances at the end of the stipes and base of the involucres vary much in their relative degree of prominence, but appear to me to show no constancy in this respect even on the samo plant.

2. PILULARIA, Linn.

Rhizome filiform, creeping, rooting at the nodes. Barren fronds reduced to a filiform stipes, few or clustered at the nodes. Involucres solitary at the nodes, sessile or shortly stipitate, globular. Sori 2 to 4, vertically adnate, their indusia at first pulpy at length membranous, free from each other but closely contiguous, apparently dividing the involucre into 2 to 4 cells. Spore-cases numerous, the lower ones in each sorus macrosporangia, the upper ones microsporangia and much more numerous.

Besides the Australian species, which is also in New Zealand and in Western Europe, there is a North America one.

1. **P. globulifera,** *Linn.; Hook. Brit. Ferns, t.* 57.—Rootstock creeping under water, often to a considerable extent. Filiform barren fronds of a bright green like the leaves of *Isoetes,* varying from 1 to 3 in. long, usually few together at the nodes. Involucres like little pills 1½ to 2 lines diameter, slightly hairy, sessile or borne on erect or recurved stipes or peduncles, rarely above ½ in. long.—Hook. f. Fl. Tasm. ii. 159; *P. Novæ Hollandiæ,* A. Br. in Berl. Monatsber. 1863, 435, 1870, 752.

Tasmania. Near Penquite, *Gunn.*

W. Australia, *Drummond, n.* 991.

ORDER CXLVII. FILICES OR FERNS.

No true leaves. Plants consisting of a rhizome or rooting or twining stem or simple trunk, emitting either alternate or a terminal tuft of more or less leaflike *fronds*. These consist of a stalk or *stipes*, frequently bearing narrow brown glossy scales especially at the base and on the rhizome, and a simple or variously divided or compound lamina, usually more expanded and leaflike when barren than when fertile, the frond when young rolled inwards or *circinate* at the top (except in Ophioglosseæ). Spore-cases usually small, collected (rarely united) in clusters or patches called *sori* (rarely solitary) on the under surface or margins of the fertile fronds, which are either nearly similar to the barren ones or very narrow resembling simple or branched spikes. Sori either naked, or covered when young with a membrane called *indusium* (or sometimes involucre), variously opening with the growth of the spore-cases, but usually remaining attached to the frond on one or both sides or rarely in the centre.

This beautiful Order is abundant in all moist climates hot or cold, less so in dry and arid countries. The majority of the genera and a considerable number of species are as widely diffused as Grasses and Cyperaceæ. Of the 38 Australian genera, no less than 29 have a general range over the New and the Old World though some of them may be chiefly tropical others more specially extratropical, 5 more have a wide distribution but are limited to the Old World, 3 are confined or nearly so to New Zealand and the Pacific Islands, one only and that a very distinct monotypic one (*Platyzoma*) is endemic.

The systematic study of Filices has been rendered unusually tedious and complicated, not only by the great variability of the species but chiefly by the enormous multiplication of supposed genera and species, founded upon trifling and vague distinctions, which have been proposed by Pteridologists, especially since the cultivation of Ferns has become so general. In working up the Australian species my labours have been materially lessened by the kind co-operation of Mr. Baker, generally recognised as the best authority on the subject. And although here as in other cases I have throughout examined for myself and drawn up my own characters and descriptions, Mr. Baker had prepared for me the rich Australian collections in the herbaria of Kew and of F. Mueller, and has allowed me at every step to consult him on all points of doubt or difficulty. With regard to genera, I have thought it advisable to adopt the limits proposed in Hooker and Baker's Synopsis Filium with the exception only of the genera *Pteris* and *Aspidium* to which I have, following Mettenius, Thwaites and others, given greater extension than that to which they were limited by Hooker.

TRIBE 1. **Ophioglosseæ.**—*Fronds not circinate, the barren ones leaflike, the fertile spikelike, simple or branched, the stipes of both frequently combined at the base. Spore-cases globular, 2-valved, without any ring, sessile in 2 rows or in small clusters on the spike or its branches.*

Barren and fertile fronds undivided or once forked.
Spore-cases sessile, slightly connate in 2 rows on the rhachis of the spike . . . . 1. OPHIOGLOSSUM.
Barren and fertile fronds branched. Spore-cases sessile in 2 rows on the branches of the panicle . 2. BOTRYCHIUM.

Barren fronds 3-partite, with divided segments. Fertile fronds spikelike. Spore-cases in small dense clusters all round the rhachis . . . . 3. HELMINTHOSTACHYS.

TRIBE II. **Marattieæ.**—*Spore-cases without any perfect ring, opening in 2 valves or in a longitudinal slit, sessile or united, in 2 rows, in sori forming marginal lobes to the segments or placed on their under surface.*

Climbing ferns. Sori forming small lobes bordering the pinnules of the divided fronds . . . . . . 4. LYGODIUM.
Erect simple or dichotomous ferns, without expanded laminæ. Sori forming small lobes pinnately contiguous and secund at the ends of the branches . 5. SCHIZÆA.
Fronds large, bipinnate. Sori oblong, placed side by side in a continuous row on the under side of the segments near the margin.
  Spore-cases distinct, sessile in 2 rows . . . . . . 6. ANGIOPTERIS.
  Spore-cases in 2 rows, but consolidated into entire boat-shaped sori . . . . 7. MARATTIA.

TRIBE III. **Osmundeæ.**—*Spore-cases globular or nearly so without any or with an imperfect or transverse ring, opening in 2 valves or irregularly, few, sometimes solitary, rarely numerous and clustered in sori, on the under surface of the segments or pinnules.*

Fronds compound, barren ones with flat segments, fertile with linear segments. Spore-cases large, scattered along the longitudinal veins and enclosed in the revolute margins . . . . 8. CERATOPTERIS.
Fronds simply pinnate, with small pinnules. Sori of 2 to 4 spore-cases, terminating transverse veins proceeding from the midrib . . . . 9. PLATYZOMA.
Fronds dichotomous. Pinnules pinnately distichous. Sori of few spore-cases, attached to one branch of forked veinlets proceeding from the midrib . 10. GLEICHENIA.
Fronds bipinnate. Sori of few or numerous spore-cases at the base of or covering the veins proceeding from the midrib . . . . 11. TODEA.

TRIBE IV. **Hymenophylleæ.**—*Spore-cases depressed, with a transverse ring, sessile or nearly so on a columnar receptacle within a cup-shaped or 2-lobed indusium, embedded in or protruding from the margin of the frond. Fronds of a thin membranous half-pellucid texture.*

Indusium cup-shaped or tubular, with an entire or shortly 2-lobed margin. Receptacle often exserted . . . . 12. TRICHOMANES.
Indusium divided to below the middle into 2 valves. Receptacle usually included . . . . 13. HYMENOPHYLLUM.

TRIBE V. **Cyatheæ.**—*Tree ferns. Fronds large, compound. Spore-cases small, with a more or less oblique ring, sessile on a slightly raised receptacle, in globular sori on the under surface of the fronds.*

Indusium at first globular enclosing the sorus, at length cup-shaped under it . . . . 14. CYATHEA.
Indusium when open attached only by the lower margin and not forming a comple ring, often small and evanescent . . . . 15. HEMITELIA.
No indusium . . . . 16. ALSOPHILA.

TRIBE VI. **Polypodieæ.**—*Habit various. Spore-cases small, with a longitudinal or scarcely oblique ring, numerous and stipitate in sori or patches on the under-side or rarely the margins of the frond.*

A. *Sori covered at least when young with an indusium.*

Sori globular or slightly oblong. Indusium cup-shaped or globular and 2-valved.
Sori close to the margin. Indusium adnate on the upper side, opening in 2 valves or leaving a complete ring . . . . 17. DICKSONIA.
Sori and indusium protruding from the margin . . 18. DEPARIA.
Sori close to or near the margin. Indusium adnate at the base only or along the sides forming with the frond a complete cup . . . . 19. DAVALLIA.
Sori linear, marginal. Indusium linear, opening from the margin inwards.
Frond simple, linear. Indusium of the texture of the frond, the sorus apparently embedded in a double margin . . . . 20. VITTARIA.
Frond pinnate or bipinnate. Indusium membranous . . . . 21. LINDSÆA.
Sori marginal. Indusium continuous with the margin and opening from the under edge outwards.
Fronds pinnate or compound. Veins of the pinnules forked or dichotomous, radiating from the petiole 22. ADIANTUM.
Fronds compound. Pinnules penninerved. Sori short. Indusium a small scale recurved over them . . . . 23. HYPOLEPIS.
Fronds compound, with small lobed segments. Sori short or globular. Indusium the slightly altered margins of the lobes curved over them . . . 24. CHEILANTHES.
Fronds various. Sori and indusia linear, usually long and continuous . . . . 25. PTERIS.
Sori in a continuous line along the midrib.
Sori on both sides of the midrib, the indusium opening from the midrib outwards.
Sori at length covering the under surface of the fertile fronds . . . . 26. LOMARIA.
Sori at length confluent over the midrib but distant from the margin . . . . 27. BLECHNUM.
Sori in a single line along the midrib, in a groove of which the edges form the indusium. Frond small, single . . . . 28. MONOGRAMME.
Sori and indusia oblong or shortly linear, parallel to the midrib, on veinlets connecting the forked veins . . . . 29. DOODIA.
Sori and indusia oblong or linear, on veins diverging from the midrib . . . . 30. ASPLENIUM.
Sori orbicular, usually small, as in *Polypodium*, but with an indusium.
Indusium concave at the base bearing the sorus . . 31. CYSTOPTERIS.
Indusium attached within the sorus, peltate or orbicular-reniform . . . . 32. ASPIDIUM.

B. *No indusium.*

Sori orbicular, usually small, variously arranged on the under surface . . . . 33. POLYPODIUM.

Sori marginal as in *Cheilanthes* but the margin unaltered in consistence, though often curved over the young sorus . . . . 34. NOTHOLÆNA.
Sori linear or oblong, on veins diverging from the midrib, sometimes crowded in an intramarginal line . . . . 35. GRAMMITIS.
Sori long, linear, on the longitudinal anastomosing veins of a simple frond . . . . 36. ANTROPHYUM.
Sori confluent, at length completely covering the under surface of the fertile fronds or pinnules . . . 37. ACROSTICHUM.
Spore-cases innumerable in large patches towards the end of the fertile fronds . . . . 38. PLATYCERIUM.

TRIBE I. OPHIOGLOSSEÆ.—Barren fronds leaflike; fertile ones spikelike, simple or branched, the stipes of both frequently combined at the base (the barren lamina then resembling a leaf on the stipes of the fertile one). Spore-cases globular, 2-valved, without any ring, sessile in 2 rows or in small clusters on the spike or its branches. Fronds not circinate in vernation.

1. OPHIOGLOSSUM, Linn.

Barren frond leaflike, entire or forked at the end, reticulately veined. Fertile lamina or spike simple, pedunculate. Spore-cases sessile and more or less combined back to back in 2 rows along the rhachis, opening in a fissure transverse as to the spike, longitudinal as to the spore-case.

A small genus generally spread over the tropical and temperate regions of the globe. Of the two Australian species one has the wide distribution of the genus, the other is tropical Asiatic.

Barren frond ovate-lanceolate or linear, resembling a leaf on the peduncle of the spike . . . . 1. *O. vulgatum.*
Barren frond ribbon-like from the base, the spike appearing pedunculate on the lamina . . . . 2. *O. pendulum.*

1. **O. vulgatum,** *Linn.*; *Hook. and Bak. Syn. Filic.* 445.—Rhizome small, knotty. Combined frond solitary, from a few inches to near 1 foot high, the barren leaflike lamina sessile at or below the middle of the stipes, varying from broadly ovate or oblong-lanceolate and 1 to 2 in. long, to ovate and $\frac{1}{4}$ to $\frac{1}{2}$ in. long, or narrow-lanceolate or linear and 1 to $1\frac{1}{2}$ in. long, with every intermediate form and size, copiously reticulate when broad, the veins more longitudinal and slightly anastomosing when the lamina is narrow. Spike varying in length with the size of the plant, with very few to more than a dozen spore-cases in each row.—Hook. f. Fl. Tasm. ii. 153, t. 169; F. Muell. Fragm. v. 112; *O. gramineum,* Willd. and *O. costatum,* R. Br. Prod. 163.

N. Australia. Arnhem North Bay, *R. Brown.*

Queensland. Brisbane River, Moreton Bay, *F. Mueller* and others; Rockhampton and neighbouring districts, *Bowman*, *Thozet*, *O'Shanesy*.
N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls* and others.
Victoria. Yarra and Murray Rivers, Station Peak, etc., *F. Mueller.*
Tasmania. Common at Formosa, *Gunn;* King's Island, *Neate.*

The species is found in most warm and temperate climates, and everywhere varies so much in the size and shape of the leaflike lamina that it has been divided into a number of species, which the most acute observers in various countries have again united. In Australia some of the larger broad-leaved forms chiefly in N. S. Wales and Queensland, resemble the *O. reticulatum* Linn.; Bedd. Ferns S. Ind. t. 70, though not cordate as in Hook. and Grev. Spec. Filic. t. 20. The Australian specimens however, especially the southern ones, are generally small and intermediate between broad and narrow, many of them well represented by *O. parvifolium*, Hook. and Grev.; Bedd. Ferns S. Ind. t. 71, others by *O. ellipticum*, Hook. and Grev. Ic. Filic. t. 40, others again narrow as in *O. lusitanicum* Linn.; Hook. and Grev. Ic. Filic. t. 80.

2. **O. pendulum,** *Linn.; Hook. and Bak. Syn. Fil.* 446.—Barren frond pendulous from trees and rocks, often many feet long, ribbonlike, entire or rarely forked at the end, leaflike throughout or tapering at the base into a very short stipes. Spike 1 to 6 in. long, on a short peduncle arising from the central line of the frond not very far from the base. Spore-cases in 2 opposite rows as in *O. vulgatum*, buried when young in the continuous margin, at length occupying nearly the whole breadth of the spike.—Sieb. Fl. Mixt. n. 278; Hook. and Grev. Ic. Filic. t. 19; Hook. Gard. Ferns, t. 33; Bedd. Ferns S. Ind. t. 269.

Queensland. Head of the Brisbane, *W. Hill;* near Rockhampton, *Thozet*, *O'Shanesy*, growing usually out of the tufts of *Platycerium*.
N. S. Wales. Ash Island, *Leichhardt*.

Also in tropical Asia extending on the one hand to the Mascarene, on the other to the Pacific Islands.

2. BOTRYCHIUM, Swartz.

Barren fronds pinnate or compound. Fertile fronds with branched spikes, forming a pedunculate panicle. Spore-cases sessile in 2 rows along the branches, marginal but turned inwards, opening in a fissure, transverse as to the rhachis, longitudinal as to the spore-case.

A genus of few species, chiefly extratropical, dispersed over the New and the Old World on the northern and southern hemispheres. The Australian species are both very generally distributed.

Barren frond simply pinnate, apparently sessile or nearly so on the stipes of the fertile one . . . . 1. *B. lunaria.*
Barren and fertile fronds both compound, their respective stipites shortly united or sometimes free . . . . 2. *B. ternatum.*

1. **B. lunaria,** *Swartz; Hook. and Bak. Syn. Filic.* 447.—Combined frond 3 to 6 or rarely 8 in. high, with a few adnate scales at the base of the common stipes. Barren frond apparently proceeding from the middle of the plant, ¾ to 3 in. long, pinnate, with from 5 to 15 distant pinnæ or segments, obliquely obovate-cuneate, fan-shaped or half-moon-shaped, ¼ to ½ in. broad, of a thick consistence, entire or crenate, the forked veins radiating from the base. Fertile panicle lanceolate in outline, ¾ to 2 in. long, with few short branches, all turned to one side.—Hook. Brit. Ferns, t. 48; Hook, f. Fl. Tasm. ii. 154; F. Muell. Fragm. v. 113; Bedd. Ferns Brit. Ind. t. 208.

Victoria. Snowy Plains on the Ovens, Goulbourn, Caboga and Mitta-Mitta Rivers, *F. Mueller.*
Tasmania. Grassy plains, ascending to 4000 ft., *Gunn, Archer, C. Stuart.*

Widely spread over the temperate and cooler regions of the northern hemisphere, also in extratropical South America.

2. **B. ternatum,** *Swartz.; Hook. and Bak. Syn. Filic.* 448.—Stipites of the barren and fertile fronds free below their division and sometimes from the base. Barren laminæ 2 to 5 in. long and at least as broad, tripartite with pinnate divisions. Pinnæ ovate-lanceolate in outline, deeply pinnatifid or again pinnate, the segments denticulate. Veins diverging, almost concealed in the thick texture of the frond. Fertile panicle much branched, 1 to 3 in. long and often nearly as broad at the base.—F. Muell. Fragm. v. 113; *Osmunda ternata,* Thunb. Fl. Jap. 329,. t. 32; *Botrychium australe,* R. Br. Prod. 164; *B. virginianum,* Hook. f. Fl. Tasm. ii. 154, t. 169, not of Swartz.

Queensland. Moreton Bay, *F. Mueller;* summit of Mount Archer, near Rockhampton, *O'Shanesy, Thozet.*
N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Woolls* and others.
Victoria. Maroka Valley at an elevation of 4000 ft., *F. Mueller.*
Tasmania. Moist shady places, *Gunn;* Mersey River, *Milligan.*

Also in extratropical North America and Asia and in New Zealand.

3. HELMINTHOSTACHYS, Kaulf.

Barren frond leaflike, divided. Fertile frond a pedunculate spikelike panicle. Spore-cases globular but free, in dense clusters all round the rhachis, opening irregularly in an external slit.

The genus is limited to the single Australian species, which extends over East India, the Malayan Archipelago and New Caledonia.

1. **H. zeylanica,** *Hook. Gen. Filic. t.* 47, *2nd. Cent. Ferns, t.* 94, *Gard. Ferns, t.* 28.—Rhizome thick, creeping, with fleshy fibres. Fronds united in a stipes often 1 ft. long, the fertile leaflike lamina nearly sessile upon it, usually 3-partite, each division deeply pinnatifid.

Segments lanceolate, 3 to 5 in. long, ½ to 1 in. broad, entire or denticulate, more or less decurrent and confluent at the base. Veins numerous, simple or forked, parallel and diverging from the midrib, all free or rarely anastomosing. Spike or rather spikelike panicle 2 to 4 in. long, the peduncle at least as long above the barren lamina. Clusters of spore-cases short and crowded, each cluster usually terminating in a crestlike appendage (abortive spore-cases?)—Bedd. Ferns S. Ind. t. 69; F. Muell. Fragm. v. 113.

Queensland. Rockingham Bay, *W. Hill, Dallachy*; Port Denison and Daintree River, *Fitzalan*; Rockhampton, *Thozet*.

TRIBE II. MARATTIEÆ.—Fronds circinate in vernation. Spore-cases without any perfect ring, opening in 2 valves or in a longitudinal slit, sessile or united, in 2 rows, in sori forming marginal lobes to the rhachis or segments, or placed on their under surface.

4. LYGODIUM, Swartz.

Climbing ferns, with long twining stems. Fronds pinnately or in species not Australian dichotomously divided, inserted on the common stem in divaricate pairs, usually on a very short common stalk or petiole. Pinnules usually ovate or lanceolate, at least when barren. Spore-cases globular or transversely oblong, with longitudinal striæ at the upper end, opening in a longitudinal slit, sessile in two rows, in sori forming small lobes bordering the pinnules or in a separate panicle, with a small scale under each spore-case.

A tropical genus widely spread over the New as well as the Old World. Of the three Australian species two have a wide range in the Old World, the third is only in the Pacific Islands.

Fronds simply pinnate. Pinnules articulate on the petiole. Veins all free	1 *L. scandens.*
Fronds simply pinnate or the lower pinnæ again pinnate. Pinnules articulate on the petiole. Veins often anastomosing	2. *L. reticulatum.*
Fronds more or less bipinnate. Pinnules not articulate, often decurrent on the petiole. Veins all free . . .	3. *L. japonicum.*

1. **S. scandens,** *Swartz; Hook. and Bak. Syn. Filic.* 437.—Stems rather slender, but twining and climbing to a considerable extent, glabrous or slightly pubescent. Fronds of each pair pinnate. Pinnules 5 to 10 or more, from cordate-ovate to oblong-lanceolate or hastate, varying from ½ to 1½ in. long, often shortly lobed at the base, and always articulate on a slight thickening of the apex of the petiolule, which persists on the common rhachis after the pinnules have fallen off. Veins forked, free, radiating from the petiolule, with a more or less distinct central nerve. Sori protruding from the margins of pinnules similar to the barren ones, sometimes all very short with 3 to 6 pairs of spore-cases, sometimes in the same specimen 4 to 5 lines

long, with 12 to 15 pairs of spore-cases.—Bedd. Ferns S. Ind. t. 61; *L. microphyllum*, R. Br. Prod. 162; F. Muell. Fragm. v. 113.

N. Australia. Port Darwin, *Schultz*, n. 382; Adams Bay, *Hulse;* Liverpool River, *Gulliver*.

Queensland. Sandy Cape, Hervey Bay, *R. Brown;* Cape York and Endeavour River, *W. Hill*, *Daemel*, *N. Taylor;* Rockingham Bay, *Dallachy;* Port Denison, *Fitzalan;* Rockhampton, *Thozet;* Brisbane River, Moreton Bay, *A. Cunningham*, *F. Mueller*.

N. S. Wales. Tweed River, *Guilfoyle*.

Widely spread over tropical Asia, received also from tropical Africa.

2. **L. reticulatum,** *Schkuhr, Spec. Filic.* 139, *t.* 139.—Habit of the larger specimens of *L. scandens*, and the pinnules similarly articulate on the petiolule, but usually larger, lanceolate, rather more rigid, often above 2 in. long, the lower ones of the frond often again pinnate, with 3 to 5 secondary pinnules. Veins forked, diverging from a central nerve and occasionally crossing each other or anastomosing. Sori small, usually numerous and crowded along the margins, each with 3 to 12 pairs of spore-cases.—Hook. and Bak. Syn. Filic. 439; *Hydroglossum scandens*, Presl; Bail. Queensl. Ferns, 62.

Queensland. York Peninsula, *N. Taylor;* Daintree River, *Fitzalan;* Rockingham Bay, *Dallachy*.

Also in the Pacific Islands.

3. **L. japonicum,** *Swartz; Hook. and Bak. Syn. Filic.* 439.—Fronds pinnate as in *L. scandens*, but the pinnules much longer and narrower, not articulate but often very narrowly decurrent on the petiolule, and usually sprinkled with short hairs, the lower ones of each frond 3-fid or pinnate with 3 to 5 secondary pinnules, the central one lanceolate, varying from 1 to 6 in. long, the lateral ones shorter, entire or toothed when barren, the veins free; fertile fronds either similar to the barren ones or reduced to a branched rhachis. Sori forming short linear marginal lobes as in *L. scandens*.—*L. semibipinnatum*, R. Br. Prod. 162, F. Muell. Fragm. v. 113.

N. Australia. Islands off the North Coast, *R. Brown;* Port Darwin, *Schultz*, *n.* 20; Roper River, *McDouall Stuart;* Etheridge River, *Gulliver*.

Queensland. Cape York, *Daemel;* York Peninsula, *N. Taylor;* Endeavour River, *A. Cunningham*, *G. Brown;* Dayman's Isle, *W. Hill;* Rockingham Bay, *Dallachy*.

Spread over the Malayan Archipelago, East Indies and Eastern Asia to Japan.

5. SCHIZÆA, Sm.

Rhizome short. Fronds erect, linear, terete or very narrow, simple forked or dichotomous, without expanded laminæ. Sori forming small linear pinnules, closely imbricate in a secund spike at the end of the fertile branches, those of the two sides folded against each other with the fructification inside. Spore-cases globular, without any ring, opening in 2 valves, sessile in 2 rows covering the inner surface of the pinnules, which is really their under side, though from the curvature of the spike it may appear to be the upper one.

The genus extends over tropical and temperate America and the southern hemisphere of the Old World. Of the four Australian species one has the general range of the genus, another is scattered over the southern hemisphere chiefly extra-tropical, a third is in New Zealand, one only is endemic.

Fronds terete or nearly so, undivided. Soriferous pinnules under 2 lines long	1. *S. fistulosa.*
Fronds terete or nearly so, mostly bifid. Soriferous pinnules very narrow, 3 to 4 lines long	2. *S. bifida.*
Fronds flat, narrow-linear, undivided. Soriferous pinnules 2 lines long at the base of the spike, tapering to 1 line .	3. *S. rupestris.*
Fronds repeatedly dichotomous	4. *S. dichotoma.*

1. **S. fistulosa,** *Labill. Pl. Nov. Holl.* ii. 103, t. 250.—Fronds densely tufted, 4 to 8 in. long, terete, undivided. Spike of the fertile ones about ½ in. long, with 6 to 20 pairs of oblong soriferous pinnules scarcely above 1 line long, denticulate or shortly fringed. Spore-cases usually 4 to 8 pairs in each sorus.—Hook. and Bak. Syn. Filic. 429; F. Muell. Fragm. v. 113; *S. bifida,* Hook. f. Fl. Tasm. ii. 152.

Victoria. Tarwin River, Gipps' Land, *F. Mueller;* Mount William, *Sullivan.*

Tasmania, *Labillardière, R. Brown;* near George Town, *Gunn;* Southport. *C. Stuart;* near Circular Head, *F. Mueller.*

Also in New Zealand, New Caledonia, Madagascar and Chili.

2. **S. bifida,** *Swartz; Hook. and Bak. Syn. Filic.* 429.—Fronds terete, 9 to 18 in. high, once forked at or below the middle or rarely undivided. Spike of the fertile ones ½ to ¾ in. long, the soriferous pinnules very numerous and closely packed, narrow-linear, 3 to 4 lines long, fringed with long cilia. Spore-cases often 20 pair, much smaller than in *S. fistulosa.*—R. Br. Prod. 162; Sieb. Fl. Mixt. n. 228.

N. Australia. Near Providence Hill, *F. Mueller.*

Queensland. Port Bowen, *R. Brown;* Rockingham Bay, *Dallachy.*

N. S. Wales. Port Jackson to the Blue Mountains, *Banks and Solander, A. Cunningham, Woolls* and others; New England, *C. Stuart;* Clarence River, *Wilcox;* Macleay River, *Fitzgerald;* Richmond River, *Mrs. Hodgkinson;* southward to Twofold Bay, *F. Mueller.*

Victoria. Brighton, *F. Mueller.*

Tasmania. Southport, rare, *C. Stuart.*

Also in New Zealand. Included by F. Muell. Fragm. v. 113, in *S. dichotoma.*

3. **S. rupestris,** *R. Br. Prod.* 162.—Fronds rarely above 4 in. long, undivided, flattened, about 1 line broad, tapering to a short filiform stipes. Fertile spike under ¼ in. long, the soriferous pinnules 6 to 8 pair, denticulate but not ciliate, the lower ones about 2 lines long and from that tapering gradually to about 1 line. Spore-cases 10 to 12 pair.—Hook. and Bak. Syn. Filic. 429; F. Muell. Fragm. v 113; Hook. and Grev. Ic. Filic. t. 48; Hook. Gard. Ferns, t. 42.

N. S. Wales. Port Jackson to the Blue Mountains, on damp rocks, rare, *R. Brown; A. Cunningham Fraser, Woolls;* Illawarra, *Johnson.*

4. **S. dichotoma,** *Swartz; Hook. and Bak. Syn. Filic.* 430.—Fronds 6 in. to above 1 ft. high, dichotomously divided into very numerous branches slightly flattened especially when barren, forming a flat corymbose top, all or most of them in some specimens fertile, in others all or most of them barren. Soriferous pinnules of the fertile spike very narrow and closely contiguous as in *S. bifida*, but usually smaller, varying from 1 to nearly 3 lines long.—R. Br. Prod. 162; Hook. and Grev. Ic. Filic. t. 17; Bedd. Ferns S. Ind. t. 65; F. Muell. Fragm. v. 113; Sieb. Fl. Mixt. n. 227.

N. Australia. Port Darwin, *Schultz*, *n.* 208; Castlereagh River, *Gulliver*.

Queensland. Northumberland Islands, *R. Brown*; Cape York, *Daemel*; Endeavour River, *A. Cunningham*, *N. Taylor*, *G. Brown*; Daintree River, *Fitzalan*; Cape Sidmouth, covering the ground in large patches, *W. Hill*; Rockingham Bay and Rockhampton, *Dallachy*; Brisbane River, Moreton Bay, *F. Mueller*.

N. S. Wales. Paramatta, *Woolls*, and Blue Mountains, *Mrs. Calvert*, each a single specimen.

Extends over tropical America and Asia, the Mascarene and Pacific Islands, to New Zealand.

6. ANGIOPTERIS, Hoffm.

Trunk erect, almost arborescent. Fronds large, bipinnate, the stipes with 2 large persistent auricles at the base. Spore-cases globular, without any ring, opening inwards in 2 valves, sessile in 2 rows in oblong sori, placed side by side in a continuous row near the margin of the segments. No indusium.

The genus is limited by Hooker and others to the single Australian species, ranging over tropical and Eastern Asia to Japan and extending on the one hand to Madagascar and on the other to the Pacific Islands. It has been divided by De Vriese, Monogr. Maratt. 15, and some others into 63 species which, in so far as they may be discriminated, can only be considered as individual variations.

1. **A. evecta,** *Hoffm.; Hook. and Bak. Syn. Filic.* 440.—Trunk thick and erect, attaining sometimes 2 or 3 ft. Fronds spreading very broad, sometimes 12 to 15 ft. long, on a more or less pubescent stipes but otherwise quite glabrous, green and shining. Secondary pinnules or segments linear-oblong, 3 to 8 in. long, abruptly acuminate, crenate-serrate or rarely entire. Veins nearly parallel, diverging from the midrib, entire or forked. Spore-cases 4 to 6 pairs in each sorus.—Hook. and Grev. Ic. Filic. t. 36; Hook. Filic. Exot. t. 75.

Queensland. Rockingham Bay, *W. Hill*, *Dallachy*; Daintree River, *Fitzalan*.

7. MARATTIA, Sm.

Rhizome large, tuberous. Fronds large, twice or thrice pinnate, the stipes with adnate auricles at the base. Spore-cases completely united in 2 rows, in oblong boat-shaped sori, placed side by side in a continuous row close to the margin of the pinnules or between the midrib and the margin, the spore-cases opening inwards in longitudinal slits without any other external mark to distinguish them, the sorus appearing divided into so many cells in 2 rows.

A genus of few species dispersed over the tropical regions of the New and the Old World and the southern extratropical ones of the Old World. The only Australian species has a general range in the Old World.

1. **M. fraxinea,** *Sm. Ic. Ined. t.* 48.—Fronds 9 to 12 ft. long (*Dallachy*). Secondary pinnules or segments oblong-lanceolate, acuminate, often 8 in. long and 1½ in. broad, but much smaller in other specimens, with numerous parallel simple or forked transverse veins, the barren point usually serrate, the fertile portion entire or shortly serrate. Boat-shaped sori rather above 1 line long, oblique and close together in a continuous row close to the margin, the vein on which they rest sometimes slightly expanded and fringed, but scarcely so in our Australian specimens; upper surface of the sorus concave, the slits and cells indicating the number of united spore-cases, 5 to 8 pair in each sorus.—Hook. and Bak. Syn. Filic. 440; Bedd. Ferns S. Ind. t. 79; *M. salicina*, Sm.; F. Muell. Fragm. v. 114.

Queensland Rockingham Bay, *W. Hill, Dallachy;* York Peninsula, *N. Taylor;* Daintree River, *Fitzalan;* Bowen, *Woolls.*

N. S. Wales. Lord Howe's Island, *C. Moore*, with smaller pinnules and longer sori of 15 to 20 pairs of spore-cases.

Spread over the tropical and southern extratropical regions of the Old World. The species should include several of those proposed by De Vriese, Monogr. Maratt. 3.

TRIBE III. OSMUNDEÆ.—Fronds circinnate in venation, divided or compound. Spore-cases globular or nearly so, without any or with an imperfect or transverse ring, opening in 2 valves or irregularly, few, sometimes solitary, rarely many and clustered, in sori on the under surface of the segments or pinnules.

The typical *Osmunda* is not Australian, but is nearly allied to *Todea barbara.*

8. CERATOPTERIS, Brongn.

Fertile fronds compound with narrow linear segments. Sori of single globular spore-cases opening irregularly, with an incomplete or rudimentary ring, inserted on longitudinal veins between the midrib and the margins of the segment. Indusium continuous and membranous, formed of the revolute margin of the segment. Spores large, marked with concentric rings.

The genus is limited to the single Australian species which is widely distributed over the tropical regions of the New and the Old World.

1. **C. thalictroides,** *Brongn.; Hook. Spec. Filic.* ii. 235, *Syn. Filic.* 174.—An aquatic or semiaquatic annual fern. Fronds twice or thrice pinnate, the fertile ones 6 in. to 1 ft. high, the secondary or

tertiary pinnæ short, with few distinct linear segments ¾ to above 1 in. long, the revolute margins enclosing the fructification the whole length. Barren fronds distinct, shorter and more spreading, with fewer short broad variously shaped segments, flat and of a soft half succulent texture. Spore-cases in the Australian specimens with a broad nearly complete ring as figured by Beddome, Ferns S. Ind. t. 75.—*Parkeria pteridioides*, Hook. Exot. Fl. t. 147; Hook. and Grev. Ic. Filic. t. 97.

N. Australia. South Goulburn Island, *A. Cunningham;* Arnhem Land, *F. Mueller;* Gulf of Carpentaria, *Landsborough.*

Queensland. Cape York, *Daemel;* Cape York Peninsula, *N. Taylor;* Rockingham Bay, *Dallachy;* Rockingham and neighbouring districts, *Bowman, O'Shanesy;* Moreton Bay, *F. Mueller.*

9. PLATYZOMA, R. Br.

Fronds tufted on a horizontal rhizome, pinnate, the pinnules small and numerous along a simple rhachis. Sori of 2 to 4 spore-cases, terminating simple veinlets proceeding from the midrib, the soriferous end free and incurved between the frond and an inner membrane. Mature spore-cases globular, very deciduous, bursting irregularly, the inner membrane of the pinnule irregularly torn and disappearing.

The genus is limited to the single species endemic in Australia, the great difference in fructification as well as in habit appears to me to preclude its union with *Gleichenia* as proposed by F. Mueller.

1. **P. microphyllum,** *R. Br. Prod.* 160.—Rhizome short, thick, densely covered with long brown setaceous scales. Fronds 6 in. to above 1 ft. high, the rhachis smooth and shining. Pinnæ exceedingly numerous, scarcely above 1 line long and broad, the revolute margins almost closed over the midrib so as to give them a globular or ovoid bullate form, glabrous outside, powdery inside especially on the midrib. Soriferous veins 2 or 3 on each side of the midrib.—Hook. and Bak. Syn. Filic. 11, t. 1, f. 1; Guillem. Ic. Pl. Austral. t. 13; *Gleichenia platyzoma*, F. Muell. Fragm. v. 114.

N. Australia. Gulf of Carpentaria, *R. Brown, Gulliver;* Arnhem Land, Fitzmaurice River and Providence Hill, *F. Mueller;* Glenelg River, N. W. Coast, *Martin.*

Queensland. Facing Island, *R. Brown, W. Hill;* York Peninsula, *Taylor;* Rockingham Bay, *Dallachy;* Downs of the interior, *Mitchell, Woolls, Birch, Bowman* and others.

It is not easy in dried specimens to find the perfect sori in situ, for when ripe they are generally seen loose in the pinnule, and the inner membrane which confined them broken up or withered away.

10. GLEICHENIA, Sm.

Fronds from a creeping rhizome erect or scrambling, the main rhachis dichotomous, with numerous entire or pinnatifid pinnules, distichous along the ultimate branches and often also below the last forks. Sori without indusium, of few (2 to 12) spore-cases attached to one branch of forked veinlets, either superficial or slightly embedded in the substance of the frond. Spore-cases surrounded by a transverse ring and opening vertically in 2 valves.

The genus is spread over the tropical and subtropical regions of the New and the Old World, extending into cooler regions in the southern hemisphere. Of the four Australian species one is generally distributed over the area of the genus, the three others extend to New Zealand and New Caledonia, and two of them also into the Malayan Archipelago.

Pinnules divided to the midrib into numerous small segments, each with a single sorus.
  Segments flat or with recurved margins, not bullate. Spore-cases usually 3 or 4, near the upper inner angle . . . 1. *G. circinata.*
  Segments bullate, the recurved margins almost closed over to the rhachis. Spore-cases usually 2, in a cavity more than half the breadth of the segment . . . . . . 2. *G. dicarpa.*
Pinnules entire or scarcely serrulate. Veinlets pinnate along the midrib, forked, each with a sorus on one branch.
  Pinnules green on both sides, continued on the branches of the rhachis below the last fork. Sori of 3 or 4 spore-cases . . . . 3. *G. flabellata.*
  Pinnules glaucous underneath, only on the last branches of the rhachis above the last fork. Sori of 8 or more spore-cases . . . . 4. *G. dichotoma.*

1. **G. circinata,** *Swartz, Syn. Filic.* 165, 394.—Fronds sometimes short, but often repeatedly dichotomous and scrambling to the height of many feet, the main rhachis glabrous or shortly scaly-hirsute. Pinnules numerous along the ultimate branches, 1 to 2 in. long, pinnately divided into numerous ovate or almost orbicular segments, 1 to 1½ lines diameter, adnate by the broad base, often whitish underneath, flat or the margins more or less recurved or revolute. Sori of 2 to 4 spore-cases, superficial or half immersed in a slight cavity near the upper basal angle of the segments.—Hook. and Bak. Syn. Filic. 11; F. Muell. Fragm. v. 115; *G. speluncæ*, R. Br. Prod. 160; Guillem. Ic. Pl. Austral. t. 12; Sieb. Fil. Exs. n. 87, and Fl. Mixt. n. 229; *G. microphylla* (rhachis hirsute) R. Br. Prod. 161; Hook. f. Fl. Tasm. ii. 130; *G. semivestita*, Labill. Sert. Austr. Caled. t. 11; Bedd. Ferns Brit. Ind. t. 177; *G. rupestris*, (margins of segments recurved), R. Br. Prod. 160.

N. Australia. Upper Victoria River, *F. Mueller.*

Queensland. Moreton Bay, *F. Mueller.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls* and others; northward to Macleay River, *Beckler;* Richmond River, *Wilcox;* southward to Illawarra, *Johnson.*

Victoria. From the Grampians, *Sullivan*, and Portland, *Allitt*, to Upper Gipps' Land, *F. Mueller.*

Tasmania. King's Island, *R. Brown;* common in loose forest land, *J. D. Hooker* and others.

S. Australia. Mount Lofty Ranges, *F. Mueller.*

Also in New Zealand, New Caledonia and the Malayan Archipelago and Peninsula.

2. **G. dicarpa,** *R. Br. Prod.* 161.—Fronds of the smaller specimens of *G. circinata*, with the rhachis glabrous or scaly-hispid, but the segments, mostly under 1 line diameter, are almost globular and bullate, the revolute margins almost closed over to the rhachis. Sori large in proportion, of 2 or rarely 3 spore-cases, in a broad cavity close to the rhachis, occupying more than half the breadth of the segment.—Hook. Filic. Exot. t. 40; Kunze, Farrenkr. t. 70, f. 2; Hook. f. Fl. Tasm. ii. 131; F. Muell. Fragm. v. 115.

Queensland. Rockingham Bay, *Dallachy*; Moreton Island, *F. Mueller*.
N. S. Wales. Port Jackson, *Woolls* and others; New England, *Perrott*; Macleay River, *Beckler*; Twofold Bay, *F. Mueller*.
Victoria. From the Grampians to Gipps' Land, *F. Mueller* and others.
Tasmania, *Labillardière*; Port Dalrymple and Derwent River, *R. Brown*; abundant especially in subalpine districts, *J. D. Hooker*.

G. alpina, R. Br. Prod. 161, Hook. and Grev. Ic. Filic. t. 58, is a smaller and more villous form from the summit of Mount Wellington.

The species is also in New Zealand, New Caledonia and the Malayan Archipelago

3. **G. flabellata,** *R. Br. Prod.* 161.—Fronds repeatedly dichotomous, attaining 2 to 4 ft. in height. Pinnules numerous along the last branches and continued along the rhachis below the last fork, linear-lanceolate, entire or the margins obscurely undulate, rarely above 1 in. long, dilated and sometimes confluent at the base, 1 to 1½ lines broad, glabrous or with a few scaly hairs underneath, the numerous veinlets proceeding from the midrib forked, one fork bearing below the summit a superficial sorus of 2 to 5, usually 3 or 4, spore-cases.—Hook. Spec. Filic. i. 6; Filic. Exot. t. 71; Hook. and Bak. Syn. Filic. 12; Hook. fil. Fl. Tasm. ii. 131; F. Muell. Fragm. v. 114.

Queensland. York Peninsula, *N. Taylor*; Rockingham Bay, *W. Hill, Dallachy*; Brisbane River, Moreton Bay, *F. Mueller*.
N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *A. Cunningham* and others; New England, *C. Stuart*; Clarence River, *Wilcox*; Tweed River, *C. Moore*; Illawarra, *Johnson*.
Victoria. From the Dandenong Range and Grampians, *F. Mueller*, to East Gipps' Land, *Walter*.
Tasmania. Damp shady places, not very common, *J. D. Hooker*.

Var. *tenera*, a small alpine form.—*G. tenera*, R. Br. Prod. 161.—Mount Wellington, Tasmania, *R. Brown* and others.

The species is also in New Zealand and New Caledonia.

4. **G. dichotoma,** *Hook. Spec. Filic.* i. 12.—Fronds dichotomous. Pinnules undivided, linear or linear-lanceolate as in *G. flabellata*, but only on the last branches of the stipes above the last fork, mostly about 1 in. long, rather rigid, glaucous underneath, dilated and often shortly confluent at the base, the lowest one on the outer side of the rhachis usually longer and more or less pinnatifid. Transverse veinlets proceeding from the midrib branching at the base, one branch bearing near the base a sorus of 8 to 12 spore-cases.—Hook. and Bak. Syn. Filic. 15; Bedd. Ferns S. Ind. t. 74; *Polypodium dichotomum*,

Thunb.; *Mertensia dichotoma,* Willd.; Schkuhr, Filic. t. 148; *Gleichenia Hermanni,* R. Br. Prod. 161; F. Muell. Fragm. v. 114.

N. Australia. Hunter's River, York Sound, *A. Cunningham;* Victoria River, *F. Mueller;* Port Darwin, *Schultz, n.* 187, 486.

Queensland. Shoalwater Bay, *R. Brown;* Daintree River, *Fitzalan;* Rockingham Bay, *Dallachy;* Brisbane River, Moreton Bay, *F. Mueller* and others.

N. S. Wales. Port Jackson, *Woolls, Bynoe.*

Dispersed over the tropical and subtropical regions of the New and the Old World. R. Brown in transferring it from *Polypodium* to *Gleichenia* rejected Thunberg's specific name as being characteristic of the whole genus and therefore no longer appropriate for a single species. Willdenow nevertheless retained Thunberg's name, but placed the plant in *Mertensia,* now generally united with *Gleichenia.* Hooker first adopted Thunberg's specific name under *Gleichenia,* and has been followed by most others. The genera in ferns have been thrown into such confusion and uncertainty that pteridologists acknowledge a right of priority in specific names whatever may have been the genus under which they may have been first published.

11. TODEA, Willd.

Trunk or rhizome erect. Fronds compound. Spore-cases globular, without any or only a very obscure transverse ring, opening to the base in 2 valves, clustered in sori on the under surface of the segments.

A genus of few species, dispersed over South Africa, the Malayan Peninsula, the South Pacific Islands and New Zealand. Of the three Australian species one is in South Africa and New Zealand, another in New Guinea and the South Pacific Islands, the third is endemic.

Pinnules of a firm consistence, entire or serrulate. Sori at length covering the base of the lower pinnules . . . . 1. *T. barbara.*
Pinnules of a membranous half pellucid consistence. Sori of few small spore-cases close to the midrib.
  Pinnules serrate . . . . 2. *T. Fraseri.*
  Pinnules deeply pinnatifid . . . . 3. *T. Moorei.*

1. **T. barbara,** *T. Moore; Hook. and Bak. Syn. Filic.* 427.—Trunk erect, attaining sometimes 5 ft. Fronds varying from under 2 ft. to above 8 ft. long, glabrous, twice pinnate. Primary pinnæ numerous, from 3 or 4 in. to 1 ft. long. Pinnules numerous, of a firm consistence, narrow-lanceolate, ½ in. to 2 in. long, entire or more frequently serrate, the upper ones decurrent and confluent at the base. Sori on the oblique simple or forked veinlets, usually covering the greater part of the under surface of the lower pinnules of the lower pinnæ, the rest of the frond barren. Spore-cases rather large.—*Osmunda barbara,* Thunb.; R. Br. Prod. 163; *Todea africana,* Willd.; Hook. f. Fl. Tasm. ii. 153, t. 168; F. Muell. Fragm. v. 114.

Queensland. Rockingham Bay, *Dallachy;* Bowen, *Woolls;* Moreton Bay, *W. Hill.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Fraser, A. Cunningham;* New England, *C. Stuart;* Clarence River, *Wilcox;* Illawarra, *Johnson.*

Victoria. Grampians, *Wilhelmi.*

Tasmania. Abundant on the Yorktown rivulet, scarce elsewhere, *Gunn;* Recherche Bay, *Oldfield.*

Also in South Africa and New Zealand.

2. **T. Fraseri,** *Hook. and Grev. Ic. Filic.* t. 101.—Trunk or rhizome thick and erect. Fronds 1 to 3 ft. long, twice pinnate. Pinnules lanceolate, dark green and of a thin membranous texture like that of *Trichomanes*, ½ to 1 in. long, deeply serrate. Spore-cases small and few, at the base of the midrib and of a few of the lateral veins of the lower pinnules.—Hook. and Bak. Syn. Filic. 427.

N. S. Wales. Deep gullies of the Blue Mountains, rare, Bougainville Cataracts, *Fraser*, near Wilson's, *Woolls;* Currajong, *Hillyard.*

Also in New Guinea and the South Pacific Islands.

3 **T. Moorei,** *Bak. in Trim. Journ. Bot.* 1873, 16.—Trunk 1 to 1½ ft. high, 6 in. diameter. Fronds often 4 ft. long, twice pinnate. Pinnules lanceolate, of the thin membranous consistence of *D. Fraseri*, deeply pinnatifid, with linear-oblong segments denticulate at the end. Spore-cases as in *D. Fraseri* few and small.

N. S. Wales. Lord Howe's Island, Mount Gower, *C. Moore, Fitzgerald.*

TRIBE IV. HYMENOPHYLLEÆ. — Fronds of a thin membranous consistence and half pellucid, on a creeping rhizome and often small. Spore-cases depressed, with a transverse ring, sessile or nearly so on a columnar receptacle arising from the base of a cup-shaped or deeply 2-valved indusium, embedded in or protruding from the margins of the fronds, and of a consistence nearly similar.

12. TRICHOMANES, Linn.

Rhizome creeping, slender as in *Hymenophyllum* or short and rather thick. Fronds usually small, of a delicate membranous half pellucid texture, entire or variously divided and nerved. Sori terminal or lateral. Indusium of the texture of the frond and continuous with it, tubular or turbinate at the base and immersed in the margin of the frond or protruding from it, with a narrow usually spreading border entire or nearly so. Receptacle linear, usually exserted. Spore-cases sessile at or near its base.

A large genus, with the wide geographical range of *Hymenophyllum*, to which it is closely allied, differing only in the shape of the indusium. Of the eleven Australian species none are endemic, one being found also in New Zealand, eight extend more or less over the Indian Archipelago, the Mascarene and South Pacific Islands, and two generally distributed over the tropical regions of the New and the Old World.

Fronds small, undivided or palmately lobed.
  Fronds sessile, orbicular, peltate, ½ to 1 in. diameter . . . 1. *T. peltatum.*
  Fronds oblong or linear-cuneate, entire or rarely 2-lobed,
    under ½ in. long . . . . 2. *T. vitiense.*
  Fronds orbicular, 3 to 4 lines diametor, palmatifid . . . 3. *T. parvulum.*
  Fronds deeply divided into 3 to 6 linear denticulate lobes,
    ½ to near 1 in. long . . . . 4. *T. digitatum.*
Fronds pinnately divided, with toothed or shortly lobed
  segments; veins pinnate or forked.

Fronds (2 to 4 in.) pinnate, with few thin linear-lanceolate pinnules toothed or shortly lobed near the base . . . 5. *T. venosum.*
Fronds (2 to 4 in.) pinnate with numerous rather thick crowded nearly equal rather broad ciliate-toothed lobes . . . . 6. *T. javanicum.*
Fronds (3 to 5 in.) bipinnate with rather thick pinnatifid pinnules and linear toothed segments . . . . . . 7. *T. rigidum.*
Fronds twice or thrice pinnately divided or more compound, the ultimate lobes linear thin 1-nerved. Sori lateral.
Fronds (1 to 2 in.) pinnate, with ovate once or twice pinnatifid pinnules . . . . 8. *T. pyxidiferum.*
Fronds (3 to 8 in.) pinnate, with narrow bipinnatifid pinnules often tapering to a point . . . . 9. *T. caudatum.*
Fronds (4 to 8 in.) bipinnate, with bipinnatifid pinnules.
Ultimate lobes linear. Indusia above ¼ line long and broad with a broad 2-lobed border . . . . . . 10. *T. apiifolium.*
Ultimate lobes setaceous. Indusia under ¼ line long, with a small entire border . . . . 11. *T. parviflorum.*

1. **T. peltatum,** *Baker in Journ. Linn. Soc.* ix. 336, t. 8, *C.*; *Syn. Filic.* 73.—Rhizome filiform. Fronds sessile, orbicular, attached at or near the centre, overlapping each other and closely appressed, about ¼ in. diameter in our Australian specimens, nearly 1 in. in others, entire or shortly and broadly lobed. Veins numerous, entire or forked, radiating from the base or one principal one slightly pinnate. Sori few. Indusia with an oblong tube more or less embedded in the margin, the border narrow, obscurely 2-lobed. Receptacle not exserted.

Queensland. Trinity Bay, *Bailey.*

Also in the islands of the South Pacific.

2. **T. vitiense,** *Baker in Journ. Linn. Soc.* ix. 338, *t.* 8, *D.*; *Syn. Filic.* 74.—Rhizome filiform. Fronds shortly stipitate, oblong or linear-cuneate, entire or rarely 2-lobed, 1-nerved, 3 to 5 lines long. Sorus single, terminal. Indusium with an oblong tube embedded in the margin or scarcely exserted, the border narrow, shortly spreading, entire. Receptacle shortly exserted.—F. Muell. Fragm. viii. 32.

Queensland. Brisbane River, *Bailey.*

Also in the Fiji Islands.

3. **T. parvulum,** *Poir.*; *Hook. Spec. Filic.* i. 118; *Syn. Filic.* 75.—Rhizome filiform, tomentose or glabrous. Fronds shortly stipitate, ovate-cuneate orbicular or almost reniform, 3 to 4 lines diameter, unequally palmatifid, the deeper lobes reaching below the middle, all obtuse or emarginate Sori terminal. Indusium with an oblong tube almost entirely embedded in the margin, with a very short slightly spreading border. Receptacle included or shortly exserted.—Bail. Queensl. Ferns, 60.

Queensland. Rocks near Brisbane, *Bailey.*

Also in the Mascarene Islands, the Malayan Archipelago, East tropical Asia and the South Pacific Islands.

4. **T. digitatum,** *Swartz; Hook. Spec. Filic.* i. 119; *Syn. Filic.* 76.—Rhizome filiform. Fronds on a rather long capillary stipes, ¼ to ½ in. long, deeply and unequally divided into 3 to 6 broadly linear obtuse entire or notched lobes, bordered by a few small teeth. Indusia broader than in most species, but embedded in the apex of the lobes, with a very short open entire border.—*T. lanceum*, Bory; Hook. and Grev. Ic. Filic. t. 33; *T. calvescens*, V. de Bosch in Hook. and Bak. Syn. Filic. 77.

N. S. Wales, *Vicary;* Illawarra, *C. Moore.*

Spread over the Mascarene Islands, the Malayan Archipelago and the South Pacific Islands.

5. **T. venosum,** *R. Br. Prod.* 159.—Rhizome woolly-scaly. Fronds on a filiform stipes, of a very delicate texture, 2 to 4 in. or rarely longer, pinnate. Pinnules linear or lanceolate, mostly ½ to 1 in. long, toothed or with a few short unequal lobes near the base, the veinlets of each pinnule pinnate, with simple or forked branches, the midrib flexuose. Indusium embedded in a short lobe near the base of the pinnule on the inner side, oblong, with a short spreading entire border. Receptacle usually exserted.—Hook. Spec. Filic. i. 132; Syn. Filic. 82; Hook. and Grev. Ic. Filic. t. 78; Hook. f. Fl. Tasm. ii. 135; F. Muell. Fragm. v. 116.

N. S. Wales. Port Jackson, *R. Brown, A. Cunningham, Woolls;* Clarence River, *Wilcox;* Cape Howe, *Walter.*

Victoria. Dandenong Ranges, sources of the Yarra, *F. Mueller.*

Tasmania. Derwent River, *R. Brown;* abundant, clothing the trunks of tree-ferns, etc., *J. D. Hooker.*

Also in New Zealand.

6. **T. javanicum,** *Blume.; Hook. Spec. Filic.* i. 130; *Syn. Filic.* 83; *Gard. Ferns, t.* 37.—Fronds lanceolate in outline, often falcate, 3 to 4 in. long, pinnate. Pinnules numerous, crowded along the rhachis, lanceolate-falcate, shortly stipitate, about ½ in. long, of a thicker consistence and darker coloured than most species, penniveined, the oblique simple or forked veinlets mostly produced into short setaceous teeth beyond the margin. Indusia few, along the inner margin below the middle, wholly exserted, narrow-oblong, with a small spreading border. Receptacle exserted.—Hook. and Grev. Ic. Filic. t. 240; Bedd. Ferns Brit. Ind. t. 180.

Queensland. Daintree River, *Fitzalan.*

Also in the Malayan Archipelago.

7. **T. rigidum,** *Swartz; Hook. Spec. Filic.* i. 133; *Syn. Filic.* 86. —Rhizome short and thick. Fronds ovate-lanceolate or triangular in outline, 3 to 5 in. long, 1½ to 3 in. broad at the base, dark and almost coriaceous, bipinnate, with deeply pinnatifid lanceolate pinnules and linear dentate segments, the primary and secondary rhachis winged only towards the end. Indusia partially embedded in the lower inner teeth

or lobes of the tertiary segments, or sometimes wholly free without any winged margins, narrow, with a small spreading entire border. Receptacle exserted. — Bedd. Ferns S. Ind. t. 8; F. Muell. Fragm. v. 115.

Queensland. York Peninsula, *Hahn's Expedition*, *N. Taylor;* Rockingham Bay, *W. Hill*, *Dallachy;* Trinity Bay and Islands off the Coast, *Bailey*; Daintree River, *Fitzalan;* Bowen, *Woolls.*
N. S. Wales. Macleay River, *Fitzgerald.*

Very widely spread over the tropical regions of the New and Old World.

8. **T. pyxidiferum,** *Linn.; Hook. Spec. Filic.* i. 124; *Syn. Filic.* 81.—Fronds in the Australian specimens 1 to 2 in. long, ovate or oblong in outline, pinnate. Pinnules ovate, deeply pinnatifid or bipinnatifid, the lower ones usually distinct, the upper ones connected by a winged rhachis; lobes few, linear, 1-nerved. Indusia occupying nearly the whole of short lateral lobes, often several to each pinnule, oblong, with a broad orifice scarcely 2-lobed. Receptacles either very long or scarcely exserted.—Hook. and Grev. Ic. Filic. t. 206.

Queensland. York Peninsula, *N. Taylor;* Bellenden Ker Range, Rockingham Bay, *Dallachy.*

Widely spread over the tropical regions of the New and the Old World.

9. **T. caudatum,** *Brackenr. Ferns U. S. Expl. Exped.* 256, t. 36, f. 5.—Rhizome creeping, rigid, rather stout. Fronds narrow, thin, 3 to 8 in. long, pinnate with pinnatifid pinnæ or bipinnate with pinnatifid pinnules, the ultimate segments linear, 1-nerved, the upper confluent ones short and rather distant, giving the pinnules an acuminate aspect. Indusia half immersed in the short lower inner lobes of the pinnules or segments, shortly oblong, with a narrow spreading border. Receptacle usually exserted.

N. S. Wales. Cape Byron, Port Macquarrie, New England and Illawarra, *C. Moore;* Tweed River, *Guilfoyle;* Macleay River, *Fitzgerald;* Kurrajong, *Mrs. Parker.*

Also in the South Pacific Islands, and closely allied to the tropical American *T. tenerum*, Sw. (*T. angustatum*, Carm.) to which it is referred by F. Muell. Fragm. v. 116.

10. **T. apiifolium,** *Presl.; Hook. and Bak. Syn. Filic. ed.* 2, 86.—Rhizome thick and knotty. Fronds 4 to 8 in. long, broadly ovate-lanceolate in outline, bipinnate with deeply bipinnatifid pinnules. Primary pinnules 1 to 2 in., secondary about ½ in. long; segments very narrow linear, thin, 1-nerved. Indusia almost embedded in the short inner lower lobes, the tube shortly turbinate, the border spreading often rather broad approaching that of a *Hymenophyllum.* Stipes short or long, hispid at the base with spreading bristles.—*T. meifolium*, Bory; Hook. Spec. Filic. i. 137; Syn. Filic. ed. 1, 86; *T. polyanthos*, Hook. Ic. Pl. t. 703.

N. S. Wales. New England, *C. Stuart*; Richmond River, *Mrs. Hodgkinson*; Lord Howe's Island, *C. Moore*, *Fullagar*.

Also in the Malayan Archipelago and South Pacific Islands.

11. **T. parviflorum,** *Poir. Dict.* viii. 83.—Rhizome creeping, rather thick. Fronds broadly lanceolate in outline, 3 to 5 in. long, bipinnate with deeply pinnatifid or pinnate pinnules the segments divided into 2 or 3 almost setaceous lobes, giving the whole frond a fennel-like aspect. Indusia the smallest in the genus, not ½ line long, on little recurved stipes near the base of the pinnules, turbinate, with a scarcely spreading border.—*T. fœniculaceum*, Bory; Hook. Spec. Filic. i. 135, Syn. Filic. 88.

Queensland. Rockingham Bay, *W. Hill*, *Dallachy*; York Peninsula, *N. Taylor*.

Also in the Mascarene Islands and the Malayan Archipelago. Poiret's plant was identified by Mettenius from the original specimen, and his name substituted for Bory's by Kuhn, Filic. Afric. 35.

13. HYMENOPHYLLUM, Sm.

Rhizome slender, creeping, often much branched and matted. Fronds usually small, erect, of a delicate membranous half-pellucid texture, variously divided, the lobes usually linear 1-nerved. Sori terminal or lateral Indusium of the texture of the frond and continuous with it, more or less cup-shaped at the base, and immersed in the margin of the frond, the exserted portion deeply divided into 2 broad lobes or valves. Receptacle oblong or linear, shorter than the indusium or rarely rather longer. Spore-cases sessile at or near its base.

A large genus, generally dispersed over most tropical and temperate regions of the globe, especially in America. In the northern hemisphere limited to America and the western parts of the Old World, always frequenting shady situations, with a moist atmosphere. Of the eight Australian species one is very generally spread both in the New and the Old World, one extends from East India to New Zealand, one is southern and extratropical in the New and Old World, three are in New Zealand and some South Pacific Islands, two only are endemic, and of these one is scarcely specifically distinct.

Lobes of the fronds bordered by a nerve-like margin . . 1. *H. marginatum.*
Lobes of the fronds neither bordered nor toothed.
  Stipes filiform not winged.
    Frond simply pinnate, with 2- to 5-lobed pinnules . 2. *H. rarum.*
    Frond bipinnate, with pinnatifid pinnules . . . . 3. *H. flabellatum.*
  Stipes winged. Frond bipinnate . . . . 4. *H. javanicum.*
Lobes of the fronds minutely often sparsely, serrulate.
  Fronds ovate or broad, under 1 in. long. Sori terminal.
    Fronds ¼ to ½ in. with few entire or bifid lobes . . 5. *H. minimum.*
    Fronds ½ to 1 in., with several divided lobes . . . 6. *H. pumilum.*
  Fronds usually 2 in. long or more. Sori lateral near the base of the pinnules.
    Fronds pinnate, with divided pinnules . . . . . . 7. *H. tunbridgense.*
    Fronds thrice pinnate or pinnatifid . . . . . . 8. *H. multifidum.*

1. **H. marginatum,** *Hook. and Grev. Ic. Filic. t.* 34.—Fronds on a short filiform stipes, ½ to 1 in. long, linear and entire or once or twice forked, with a central nerve and nervelike margins not toothed. Sori solitary and terminal. Indusium about ¼ line long and broad, divided nearly to the base into obovoid-orbicular valves.—Hook. and Bak. Syn. Filic. 57.

N. S. Wales. Port Jackson or vicinity, *Fraser*, *Bynoe*.

2. **H. rarum,** *R. Br. Prod.* 159.—Fronds, on a filiform stipes, 2 to 4 in. long, pinnate or deeply pinnatifid; segments or pinnæ once or twice forked, or 3- or 5-lobed, or rarely undivided, the upper segments and their lobes confluent with the narrowly winged rhachis, the lowest segments separated by a filiform rhachis; lobes linear, 1-nerved, not toothed. Sori terminal. Indusium as broad as the segment, nearly 1 line diameter, divided to the middle or rather lower into broad rounded valves.—Hook. and Bak. Syn. Filic. 58; Hook. f. Fl. Tasm. ii. 134; *H. semibivalve*, Hook. and Grev. Ic. Filic. t. 83; *H. Gunnii*, V.D. Bosc. in Hook. and Bak. Syn. Filic. 463.

Victoria. Sealer's Cove, *F. Mueller*.
Tasmania. Derwent River, *R. Brown*; abundant in damp forests often clothing trunks of *Dicksonia*, *J. D. Hooker* and others.

Also in New Zealand, South Africa, and extratropical South America.

3. **H. flabellatum,** *Labill. Pl. Nov. Holl.* ii. 101, t. 250.—Fronds ovate or lanceolate in outline, sometimes broad and under 2 in. long, more frequently elongated to 3 to 8 in., twice or thrice pinnatifid, the lower segments or pinnæ distant, the rhachis as well as the stipes filiform and not winged, the upper smaller ones confluent with the narrowly winged rhachis, the lobes not dentate. Sori lateral or terminating the smaller lobes. Indusium orbicular or rather broader than long, about ½ line diameter, deeply divided into entire valves.—Hook. Spec. Filic. i. 111; Hook. and Bak. Syn. Filic. 61; Hook. f. Fl. Tasm. ii. 134; *H. nitens*, R. Br. Prod. 159; Hook. and Grev. Ic. Filic. t. 197.

N. S. Wales. Blue Mountains, *Vicary*; New England, *C. Moore*; Richmond River, *Mrs. Hodgkinson*; Lord Howe's Island, *Fitzgerald*.
Victoria. Dandenong Range, Sealer's Cove, Apollo Bay, *F. Mueller*.
Tasmania. Derwent River, *R. Brown*; abundant in damp forests, *J. D. Hooker* and others.

Also in New Zealand.

4. **H. javanicum,** *Spreng.*; *Hook. Spec. Filic.* i. 106, *Syn. Filic.* 60.—Fronds ovate or lanceolate in outline, 3 to 4 in. long, twice or thrice pinnatifid, the rhachis winged and the narrow wings continued down the stipes; segments and lobes linear-oblong, obtuse, not dentate. Sori on short lateral lobe Indusium ovate, about ¼ line long, divided

nearly to the base into entire valves.—*H. flabellatum*, R. Br. Prod. 159, not of Labill.; *H. crispatum*, Wall.; Hook. f. Fl. Tasm. ii. 134; *H. demissum*, F. Muell. Fragm. v. 116, not of Swartz.

Queensland. Bellenden Ker Range, *W. Hill;* Rockingham Bay, *Dallachy.*
N. S. Wales. Blue Mountains, *Mrs. Calvert.*
Victoria. Sealer's Cove, *F. Mueller;* Apollo Bay, *Wilhelmi.*
Tasmania. Derwent River, *R. Brown;* abundant in damp woods, *J. D. Hooker* and others.

Also in East India, the Malayan Archipelago and New Zealand.

5. **H. minimum,** *A. Rich. Fl. Nouv. Zel.* 91. t. 14, f. 2.—Fronds on a short filiform stipes, ovate in outline, ¼ to ½ in. long, deeply divided into 5 to 8 simple or bifid segments, slightly denticulate. Sori usually one only to each frond, terminating the main axis. Indusium nearly 1 line broad, deeply divided into 2 rounded denticulate open valves.—Hook. and Bak. Syn. Fil. 464.

N. S. Wales. Lord Howe's Island, summit of Mount Lingbird, *Fullagar.* Also in New Zealand.

6. **H. pumilum,** *C. Moore in Hook. and Bak. Syn. Filic.* 464.—Closely allied to *H. minimum* and possible a large variety. Rhizome filiform, forming broad dense matted patches like *H. tunbridgense.* Fronds ovate or rhomboidal in outline, ½ to 1 in. long and nearly as broad, deeply pinnatifid, the pinnæ close together, deeply lobed, the lobes few, broadly linear, with more or less denticulate margins. Sori few, terminating short lobes or the main axis. Indusium about 1 line diameter, deeply divided into denticulate or rarely entire valves.

N. S. Wales. Mount Tomah, *C. Moore;* Lord Howe's Island, *C. Moore, Fullagar.* These Lord Howe's Island specimens were from insufficient materials described as distinct under the name of *C. Moorei*, Baker, l. c., but further specimens have shown that the supposed distinctions are not constant.

7. **H. tunbridgense,** *Sm.; Hook. Spec. Filic.* i. 95, *Brit. Ferns*, t. 43, *Syn. Filic.* 67.—Rhizome filiform, much branched, with numerous fronds, forming broad densely matted almost mosslike patches. Fronds on a filiform stipes lanceolate in outline, pinnate, rarely above 2 or 3 in. long; the pinnæ deeply divided into 3 to 8 linear lobes minutely denticulate on the margin. Sori sessile or on a very short lobe, solitary at the base of the pinnæ on their upper margin. Indusium ovate or orbicular, about 1 line diameter, divided to much below the middle into more or less denticulate valves.—R. Br. Prod. 159; Hook. f. Fl. Tasm. ii. 153; F. Muell. Fragm. v. 116; Bedd. Ferns S. Ind. t. 265; *H. cupressiforme*, Labill. Pl. Nov. Holl. ii. 102, t. 250.

Queensland. Mount Lindsey, *W. Hill.*
N. S. Wales. Port Jackson to the Blue Mountains, *Gaudichaud, Woolls* and others; New England, *C. Stuart;* Lord Howe's Island, *C. Moore.*

Victoria. Dandenong and Buffalo Ranges, Apollo Bay, Gipps' Land, *F. Mueller;* Portland, *Allitt.*

Tasmania. Derwent River, *R. Brown;* abundant in shady places, *J. D. Hooker* and others.

Widely spread over most temperate and cooler regions of the globe, in the Old World portion of the northern hemisphere a strictly western plant.

8. **H. multifidum,** *Swartz; Hook. Spec. Filic.* i. 98; *Syn. Filic.* 69.—Fronds on a filiform stipes, ovate or rhomboidal in outline, thrice pinnatifid, 2 to 4 in. long, the upper segments confluent with the winged rhachis, the lower pinnæ distinct; lobes linear, bordered by minute teeth. Sori mostly near the base of the primary or secondary pinnæ on their upper margin as in *H. tunbridgense,* from which this species differs chiefly in the much more compound fronds, and in the valves of the indusia which are usually quite entire or obscurely toothed.—Hook. and Grev. Ic. Filic. t. 167.

N. S. Wales. Lord Howe's Island, *C. Moore.* Also in New Zealand and in the South Pacific Islands.

TRIBE V. CYATHEÆ.—Trunk arborescent, at least in the Australian species. Fronds large, circinate in vernation, twice or thrice pinnate. Spore-cases numerous, small, with a more or less oblique ring, in globular sori on the under surface of the segments or pinnules.

14. CYATHEA, Sm.

Tree ferns, with large twice or thrice pinnate or in species not Australian simple fronds, the transverse veinlets of the pinnules or segments forked or divided, bearing a sorus on one of their branches, the sori arranged in a single row on each side of the midrib. Sori globular, enclosed when young in a membranous indusium which after bursting leaves a cup or complete ring under the sorus. Spore-cases numerous, sessile or nearly so on a shortly raised receptacle, each with a vertical or oblique ring.

A large tropical or subtropical genus common to the New and the Old World.

Fruiting pinnules entire or slightly crenate-serrate. Sori in parallel lines on each side of the midrib.
- Indusium large and long-persistent, enveloping the spore-cases.
  - Rhachis and pinnules glabrous or nearly so . . . . 1. *C. Lindseyana.*
  - Rhachis and under surface of the pinnules cottony or woolly . . . . 2. *C. arachnoidea.*
- Indusium very deciduous leaving only a ring. Rhachis densely cottony white or at length glabrous . . . 3. *C. Macarthurii.*

Fruiting pinnules pinnatifid with a sorus opposite each lobe.
- Pinnæ 4 to 6 in. long. Pinnules linear, 6 to 9 lines long 4. *C. medullaris.*
- Pinnæ 1 to 1½ in. long. Pinnules 3 to 4 lines long . . 5. *C. brevipinna.*

1. **C. Lindseyana,** *Hook. Syn. Filic.* 25.—"Trunk 10 to 12 ft. high, 12 inches in circumference." Rhachis of the fronds in our specimens quite glabrous. Secondary pinnæ 3 to 4 in. long. Pinnules much broader than in *C. medullaris,* the lower ones about ½ in. long and 2 lines broad, the upper ones short and confluent, membranous, glabrous or with a few scaly hairs on the midrib, serrulate but not lobed. Sori in a double row very near the midrib and distant from the margin. Indusium long-persistent, opening irregularly at the apex.

Queensland. Mount Lindsey, *W. Hill.*

2, **C. arachnoidea,** *Hook. Syn. Filic.* 24.—Trunk attaining 15 to 20 ft. Rhachis of the fronds muricate and covered as well as the under side of the segments with a close whitish or ferruginous tomentum. Secondary pinnæ 3 to 5 in. long. Pinnules or segments narrow, coriaceous, the lower ones 4 to 6 lines long and distinct, the upper ones smaller and confluent, somewhat coriaceous, the fertile portion with recurved crenulate margins. Sori in a single row on each side of the midrib but occupying nearly the whole breadth. Indusia persistent, globular, bursting irregularly at the apex.—F. Muell. Fragm. vi. 200.

Queensland. Rockingham Bay, *Dallachy.* Also in the Moluccas. Dallachy's specimens are not in fruit, but are otherwise precisely similar to the Molucca ones from which the above character is taken.

3. **C. Macarthurii,** *F. Muell. Herb.*—Trunk 10 to 12 ft. high. Fronds thrice pinnate, the rhachis densely covered with a whitish woolly tomentum, which however in some specimens has entirely disappeared. Secondary pinnæ 3 to 4 in. long. Lower pinnules quite distinct though attached by a broad base, 3 to 5 lines long, minutely serrate-crenulate, the upper ones gradually smaller and confluent, the pinnæ ending in a long dentate point. Sori rather small, on the short lateral branches of scarcely prominent forked veinlets, forming a row on each side of the central veins. Indusium complete and globular when young, but soon breaking up, leaving a perfect ring under the sorus or more frequently entirely falling away.—*Hemitelia Macarthurii,* F. Muell. Fragm. viii. 176; *Cyathea Moorei,* Hook. and Bak. Syn. Filic. 453.

N. S. Wales. Lord Howe's Island, *C. Moore, Lind and Fullagar.*

4. **C. medullaris,** *Swartz; Hook. Spec. Filic.* i. 26, *Gard. Ferns,* t. 25.—Trunk attaining sometimes 40 to 50 ft. densely covered with matted fibres in the lower part, marked higher up with the scars of fallen fronds and muricate at the top with the bases of old fronds. Fronds 10 to 20 ft. long, the rhachis and primary branches sprinkled with small tubercles. Secondary pinnæ 4 to 6 in. long, with numerous pinnules, the lower ones distinct, linear, 6 to 9 lines long, crenate or pinnatifid, the upper ones short and confluent into a pinnatifid point. Sori one to each lobe of the pinnule and occupying the greater part of its length. Indusium

broad and short under the sorus, irregularly lobed.—Hook. and Bak. Syn. Filic. 25; Schkuhr, Filic. t. 133; F. Muell. Fragm. v. 116.

N. S. Wales. Richmond River, *Woolls.*
Victoria. Cape Otway, *Wilkinson*, *Marriner.*
Tasmania. Near Circular Head, *Gunn*, *S. B. Emmett.*

Also in New Zealand, the Malayan Archipelago and South Pacific Islands.

5. **C. brevipinna,** *Baker.*—A single specimen of what appears to be the greater part of a frond, 1½ ft. long. Rhachis thick, scaly-hispid. Primary pinnæ about 6 in. long and 3 in. broad; secondary pinnæ 1 to 1½ in. long; pinnules 3 to 4 lines long, rather broad, entire or slightly lobed in the fruiting part. Sori large and one to each lobe as in *C. medullaris*, of which however this can scarcely be a variety only.

N. S. Wales. Lord Howe's Island, *Lind and Fullagar.*

15. HEMITELIA, Br.

Tree ferns, with the habit and principal characters of *Cyathea* and *Alsophila.* Sori in the typical American species towards the end of the venules and on all or most of their branches, but in the Australian one and a few others near the base of one fork as in *Cyathea.* Indusium when open half cup-shaped or semicircular, interrupted on the upper side and often very deciduous.

A tropical or subtropical genus, the typical species all American, the Australian one apparently endemic, but allied to species both in the New and the Old World.

1. **H. Moorei,** *Baker in Gard. Chron.* 1872, 252; *Syn. Filic.* 455. —Trunk 8 to 10 ft. high. Fronds thrice pinnate, scaly-hirsute with a ferruginous pubescence often quite disappearing or leaving a few tubercles. Secondary pinnæ lanceolate, 2 to 3 in. long; pinnules when fertile ½ in. long, deeply toothed or pinnatifid. Veinlets once forked with a sorus at the base of one fork. Sori thus in a single row on each side of the midrib, one opposite each lobe as in *Cyathea*, but the indusium when open dimidiate, being quite or almost interrupted on the upper side.

N. S. Wales. Lord Howe's Island, *C. Moore* and others.

H. Godefroyi, Luerss. in Journ. Mus. Godefr. vi. 4, from Brisbane River, *Amalia Dietrich*, is unknown to us, nor is it known whether it is arborescent or not. It is described from a single frond, which was at first believed to be that of an *Aspidium*, till it was ascertained that the spore-cases were those of a *Cyathea*, with a very small semicircular indusium concealed under the sorus.

16. ALSOPHILA, R. Br.

Tree ferns, with large twice or thrice pinnate fronds, the transverse veinlets of the pinnules or segments forked or divided, bearing a sorus on one or more of their branches. Sori globular, without any indusium, but the small scales scattered on the veins occasionally subtending the sorus. Spore-cases numerous, sessile or nearly so, usually more or less intermixed with hairs on a slightly raised receptacle, each with a vertical or oblique ring.

A large tropical and subtropical genus in the New and the Old World, differing from *Cyathea* only in the want of an indusium. Of the five Australian species one is also in Norfolk Island, the others appear to be endemic.

Secondary pinnæ undivided, entire or crenate-serrate .	1. *A. Rebeccæ.*
Secondary pinnæ deeply pinnatifid, the segments all confluent at the base, ovate and entire	2. *A. Loddigesii.*
Secondary pinnæ pinnate at the base, the lower pinnules distinct, the upper ones confluent, all entire serrulate or slightly crenate.	
Pinnules or segments entire or obscurely crenate, serrulate only when barren or in the barren end	3. *A. australis.*
Pinnules narrow, very neat, usually serrulate with rather small sori	4. *A. Leichhardtiana.*
Secondary pinnæ pinnate, the pinnules almost all distinct narrow and pinnatifid, hispid as well as the rhachis	5. *A. Robertsiana.*

1. **A. Rebeccæ,** *F. Muell. Fragm.* v. 53, 117.—Trunk slender, described by some as 6 ft. high and 1 in. diameter, by others as twice that height and diameter. Secondary pinnæ dark and shining, undivided, lanceolate, 2 to 3 in. long, 4 to 5 lines broad or rather more when barren, acuminate, crenate or obtusely serrate, obliquely truncate at the base but not adnate to the rhachis. Transverse veinlets with 3 to 7 branches. Sori rather large, on 2 to 4 of the branches, forming about 2 irregular rows on each side of the midrib.—Hook. and Bak. Syn. Filic. 40; Hook. Ic. Pl. t. 1015.

Queensland. Rockingham Bay, *Dallachy, W. Hill;* Port Denison and Daintree River, *Fitzalan;* Cape York Peninsula, *W. Hahn's Expedition.*

2. **A. Loddigesii,** *Kunze in Linnæa,* xxiii. 221 (*name only*); *Baker Syn. Filic.* 458.—Fronds apparently shorter than in *A. australis,* the rhachis slightly tomentose or tuberculate, but soon glabrous and smooth. Secondary pinnæ 2 to 3 in. long, lanceolate, deeply pinnatifid, the segments all confluent at the base, more ovate than in *A. australis,* 3 to 4 lines long, 2 to 2½ lines broad, obtuse or almost acute, entire; transverse veinlets entire or once forked. Sori rather small, 1 to 4 on each side of the midrib of each segment.

N. S. Wales. Cape Byron, *C. Moore,* the specimens perfectly agreeing with a cultivated one received from Kunze.

3. **A. australis,** *R. Br. Prod.* 158.—Trunk variously described by collectors as from 8 to 70 ft. high, slender or stout, completely covered from the base or only in the upper part with the bases of old fronds. Fronds 5 to 12 ft. long, twice or thrice pinnate, the base of the petiole covered with linear-lanceolate scales mixed with setaceous ones (or with only the one or the other?), the main rhachis and sometimes the

partial ones tuberculate or muricate. Secondary pinnæ 3 to 4 in. long; pinnules lanceolate or linear, the lower ones distinct and 4 to 6 lines long, the upper ones shorter and confluent, the soriferous part entire or obscurely crenate, the barren ones and the barren end of the soriferous ones often serrulate. Transverse veinlets usually once forked when soriferous, often with 3 or 4 branches when barren. Sori in 2 rows sometimes extending to the apex and as many as 8 on each side of the midrib, often fewer extending half way or reduced to very few at the base of the segment.—Hook. Sp. Filic. i. 50; Hook. and Bak. Syn. Filic. 40; F. Muell. Fragm. v. 116; Sieb. Syn. Filic. n. 122, Fl. Mixt. n. 241; Hook. f. Fl. Tasm. ii. 132; F. Muell. Fragm. v. 52; *A. excelsa*, R. Br. in Endl. Prod. Fl. Norf. 16; Hook. Spec. Filic. i. 49, t. 18, A; F. Muell. Fragm. viii. 178; *A. Cooperi*, Hook. and Bak. Syn. Filic. 459.

Queensland. Rockingham Bay, *Dallachy*, *W. Hill;* Port Denison and Daintree River, *Fitzalan;* South Queensland, *Hartman;* Mount Lindsey, *W. Hill.*

N. S. Wales. Port Jackson, *R. Brown;* frequent in shaded ravines and permanently damp woods in the immediate coast line, Port Jackson, Illawarra, etc., *A. Cunningham*, *Woolls* and others; New England, *C. Stuart;* Hastings and Clarence Rivers, *Beckler*, *C. Moore;* Richmond River, *Mrs. Hodgkinson.*

Victoria. Dandenong Ranges and Sealer's Cove, *F. Mueller;* Cape Otway, *Walter;* Grampians, *Sullivan.*

Tasmania. King's Island, *R. Brown;* not rare in shady forests, *J. D. Hooker* and others.

It is possible that the study of living specimens in their native stations may show characters for distinguishing more than one species, but as far as known the differences in the trunks do not correspond with the very indefinite differences in the fronds. In the typical *A. australis*, chiefly from N. S. Wales and Tasmania, but also among Queensland and Norfolk Island specimens, the ultimate pinnules are thin rather acute barren and serrulate at the end, the sori not reaching beyond the middle. In the Norfolk Island form originally described as *A. excelsa*, the pinnules are longer, narrower, thicker, obtuse with recurved margins, soriferous and entire or obscurely crenate to the end. But some Norfolk Island specimens are the precise counterpart of Brown's from King's Island. The Queensland specimens which gave rise to the *A. Cooperi* are generally intermediate between the two, more frequently approaching the *A. excelsa* form than the typical *australis*. Some specimens from Mount Lindsey and New England, with the recurved margins rather more distinctly crenate, are said to have the stems slender retaining the bases of the fronds only at the top. These may possibly be referrible to *A. Leichhardtiana*. Very few collectors have sent the base of the fronds. These are sometimes covered with flat scales ½ in. long or more, sometimes with setaceous brown scales only and in one case with the two intermixed.

Var? *nigrescens*. "Stem 10 to 12 ft. high, black and prickly, producing adventitious buds and fronds from the bottom to the top. Fronds large dense and heavy."—Lord Howe's Island, *C. Moore*. Of this there is only a single portion of a frond in Herb. F. Mueller, which shows no character to distinguish it from *A. australis*.

4. **A. Leichhardtiana,** *F. Muell. Fragm.* v. 53, 117. —Very nearly allied to *A. australis* and not easy to distinguish from some of its forms. Trunk generally but not always described as more slender. The fronds have generally a neater aspect, the rhachis loosely tomentose or quite glabrous; ultimate pinnules more detached narrower and more

serrate. Sori small, in very distinct series close to the midrib. Base of the stipes (in the very few specimens seen) covered with long brown setaceous hairs without the flattened scales of *A. australis.*—Hook. and Bak. Syn. Filic. ed. 2, 40; *A. Macarthurii*, Hook. l.c. ed. 1, 40.

Queensland. Near Glasshouses, *C. Moore.*
N. S. Wales. Port Jackson and Blue Mountains, *Woolls;* New England, *C. Stuart;* Clarence, Hastings and Macleay Rivers, *Beckler;* Tweed River, *Guilfoyle;* Illawarra, *Shepherd.*

A. Woollsiana, F. Muell. Fragm. viii. 179, from Rockingham Bay. *Dallachy*, only differs in the dense woolly tomentum of the rhachis which is more or less observable in some other specimens. *A. Moorei*, J. Sm. Enum. Cult. Ferns, 245, is from the synonym given and the specimens grown at Kew the typical *A. Leichhardtiana*, although the diagnosis is quite at variance.

5. **A. Robertsiana,** *F. Muell. Fragm.* v. 54, 117.—Trunk 6 to 8 ft. high, 2 to 4 in. diameter. Fronds bipinnate, the rhachis both general and partial as well as the pinnules themselves and sori hispid or sprinkled with rigid hairs. Secondary pinnæ 2 to 3 in. long. Pinnules distinct, 4 to 6 lines long, deeply pinnatifid, the upper ones of each pinna smaller more entire and confluent. Sori rather large, solitary opposite each lobe of the pinnule.—Hook. and Bak. Syn. Filic. 459.

Queensland. Rockingham Bay, *Dallachy;* Bellenden Ker Range, *W. Hill.*

TRIBE VI. POLYPODIEÆ.—Habit various. Spore-cases small, with a longitudinal or scarcely oblique ring, usually bursting on one side in the shape of little helmets, numerous and stipitate in sori or patches on the under side or rarely on the margins of the fronds, with or without an indusium.

17. DICKSONIA, L'Her.

Trunk arborescent or rhizome creeping. Fronds large, compound. Pinnules penniveined. Sori terminating veins close to the margins of the frond. Indusium either globular and 2-valved or cup-shaped and entire, the upper valve or upper part of the cup adnate to the frond and continuous with the margin.

The genus extends over the tropical and subtropical regions of the New and the Old World. Of the three Australian species one extends to New Zealand another only to Norfolk Island, the third appears to be quite endemic.

Sori on the concave lobes of the pinnules, which are closely adnate to and form the greater part of the upper valve of the indusium. Tree ferns.
  Indusium about ½ line diameter . . . . 1 *D. antarctica.*
  Indusium about 1 line diameter . . . . 2. *D. Youngiæ.*
Sori under the sinus or at the inner base of the lobes of the pinnules. Indusium cup-shaped. Rhizome creeping . 3. *D. davallioides.*

1. **D. antarctica,** *Labill. Pl. Nov. Holl.* ii. 100, t. 249.—Trunk arborescent, "attaining 30 to 50 ft., covered with matted rootlets

giving it sometimes a diameter of 4 ft." Fronds 6 to 12 ft. long, twice or thrice pinnate, the stipes smooth or with setaceous scales, the rhachis glabrous minutely scabrous or softly hairy when young. Secondary pinnæ 2 to 3 in. long. Pinnules or segments distinct or the upper ones confluent, nearly flat and acutely toothed when barren, thicker and obtusely lobed when fertile. Sori solitary on each lobe. Indusium globular, about ½ line diameter, 2-valved, the upper valve adnate to the lobe of the frond and undistinguishable from it except near the base where there is on each side a narrow free margin.—Hook. Spec. Filic. i. 66, Syn. Filic. 50; R. Br. Prod. 157; Hook. f. Fl. Tasm. ii. 132; F. Muell. Fragm. v. 117, vi. 199.

Queensland. Toowomba, *Hartmann;* Mount Lindsey, *W. Hill.*
N. S. Wales. Port Jackson to the Blue Mountains, *Woolls* and others; northward to Hastings, Clarence and Macleay Rivers, *Beckler*, *C. Moore;* southward to Illawarra, *Shepherd* and others; Twofold Bay, *L. Morton.*
Victoria. Mouth of the Glenelg, *Allitt;* Grampians, *Sullivan;* Dandenong, Buffalo Range, Upper Hume River, *F. Mueller.*
Tasmania. Abundant in damp, especially subalpine forests, *J. D. Hooker.*
S. Australia. Mount Gambier, *F. Mueller;* Lofty Range, *Heyne.*

Also in New Zealand.

2. **D. Youngiæ,** *C. Moore in Bak. Syn. Filic.* 461.—Trunk "10 to 12 ft. high, 4 in. diameter, marked by the bases of old fronds" (*C. Moore*), "30 ft. high, and 7 ft. circumference," probably including the bases of fronds (*W. Hill*). Fronds more coriaceous and glossy than in *D. antarctica.* Stipes covered with glossy brown hair; rhachis ferruginous-pubescent or glabrous, not scabrous. Secondary pinnæ 2 to 3 in. long. Pinnules 3 to 6 lines long when fertile, deeply divided into rounded lobes like those of *D. antarctica* but larger. Indusium 1 line diameter, the upper valve entirely adnate.

Queensland. Bellenden Ker Range, *W. Hill.*
N. S. Wales. Richmond River, *C. Moore;* Tweed River, *Guilfoyle;* New England, *C. Stuart.*

Appears to be quite distinct from the New Zealand *D. squarrosa*, Sw., to which it is referred by F. Mueller, Fragm. vi. 200.

3. **D. davallioides,** *R. Br. Prod.* 158. — Rhizome creeping. Fronds erect, 2 to 5 ft. high, the rhachis straight or flexuose, smooth and shining. Secondary pinnæ 3 to 4 in. long. Pinnules numerous, distinct, 1½ to ¾ in. long, membranous, pinnatifid, the lowest lobe on the upper side longer than the others. Sori small, globular, almost marginal, in the sinus or at the base of the upper side of the lobes of the pinnules. Indusium cupular, about ⅛ line diameter, entire or scarcely lobed, adnate on the upper side to the frond.—Hook. Spec. Filic. i. 71; Syn. Filic. 54; *D. nitidula*, Metten. Filic. Hort. Lips. 106, t. 28; *Dennstædtia davallioides*, T. Moore; Bail. Queensl. Ferns, 54.

N. S. Wales. Paterson's River, *R. Brown;* Blue Mountains, *Woolls* and others; Hastings River, *Beckler;* Macleay and Clarence Rivers, *C. Moore;* damp shady woods, Illawarra district, *A. Cunningham.*

Victoria. Cape Otway Ranges, *F. Mueller.*

Also in Norfolk Island. Referred by F. Muell. Fragm. v. 118, as a variety to *Davallia flaccida* (*D. speluncæ*), from which the attachment and form of the indusium appear to me distinctl to separate it.

18. DEPARIA, Hook. and Grev.

Rhizome creeping. Fronds large, compound. Sori globular, terminating a vein, protruding from the margin of the frond and sometimes stipitate beyond it. Indusium membranous, shortly and broadly cup-shaped or 2-valved.

The genus is sparingly distributed over the Pacific islands and South America. Of the two following species one is endemic, the other is a Sandwich Island plant perhaps not really Australian.

Fronds simply pinnate with long pinnatified pinnules . 1. *D. prolifera.*
Fronds twice or thrice pinnate . . . . 2. *D. nephrodioides.*

1. **D. prolifera,** *Hook. Spec. Filic.* i. 85, *Syn. Filic.* 65, *Filic. Exot. t.* 82.—Fronds 2 to 3 ft. long, simply pinnate. Lower pinnæ 6 in. to 1 ft. long, deeply pinnatifid; segments ovate or oblong, somewhat falcate, ¼ to ½ in. long, all connected by a winged rhachis 2 to 3 lines broad. Sori marginal but sessile.—*D. Macræi,* Hook. and Grev. Ic. Filic. t. 154; F. Muell. Fragm. v. 117.

N. S. Wales? A single specimen in herb. F. Mueller with the label Illawarra, without the collector's name. The species is otherwise endemic in the Sandwich Islands.

2. **D. nephrodioides,** *Baker in Gardn. Chron.* 1872, 253, *Syn. Filic.* 463.—Fronds 2 to 3 ft. high, rather firm and shining, twice or thrice pinnate. Secondary pinnæ 2 to 3 in. long, pinnate or deeply pinnatifid; lower pinnules pinnatifid, ½ to 1 in. long, upper ones gradually smaller confluent and toothed only. Sori marginal and prominent but sessile, globose. Indusium very shortly and broadly divided into 2 valves partly formed by a slight dilatation or obtuse tooth of the frond.—*Davallia nephrodioides,* F. Muell. Fragm. x. 104.

N. S. Wales. Lord Howe's Island, Mount Lingbird, *C. Moore, Lind* and *Fullagar.* This appears to be a true *Deparia* and much more nearly allied to *Dicksonia* than to *Davallia.*

19. DAVALLIA, Sm.

Rhizome creeping, often densely covered with soft scales or setæ. Fronds compound, often large, or rarely in species not Australian undivided. Sori globular or slightly elongated, terminating veins close under or at a little distance from the margin. Indusium from under the sorus either with the margins adnate to the frond and forming with it a complete cup enclosing the sorus, or attached only by its broad base and either covering the sorus, or short and open under it.

The genus is widely spread over the tropical and subtropical regions of the Old World extending to the Mediterranean, with a few tropical American species. Of the seven Australian species four have a wide range in the Old World, one is only in Norfolk Island and New Caledonia if really distinct from the Mediterranean one, the two remaining are as far as known endemic.

- Fronds coriaceous. Indusium with adnate margins forming a complete cup.
  - Pinnules oblong, obtusely lobed. Indusium narrow-oblong . . . . 1. *D. solida.*
  - Pinnules lanceolate, acutely lobed. Indusium ovate.
    - Pinnules marked with raised striæ . . . . 2. *D. elegans.*
    - Pinnules flat, the nerves slightly depressed . . . . 3. *D. pyxidata.*
- Fronds coriaceous. Indusium attached only by its broad base.
  - Fronds rarely above 3 in. long above the stipes. Indusium orbicular, covering the sorus . . . . . . 4. *D. pedata.*
  - Fronds large and compound. Indusium short and broad under the sorus . . . . 5. *D. dubia.*
- Fronds membranous. Indusium attached only by its broad base, short and broad under the sorus.
  - Secondary pinnæ lanceolate, 2 to 4 in. long. Lower pinnules ¼ to ¾ in. long, broad and pinnatifid, upper ones confluent . . . . 6. *D. speluncæ.*
  - Secondary pinnæ oblong, ½ to 1 in. long. Pinnules 2 to 4 lines long, with 2 to 4 obovate obtuse lobes . 7. *D. tripinnata.*

1. **D. solida,** *Swartz; Hook. Spec. Filic.* i. 163, *t.* 42, *Syn. Filic.* 95.—Rhizome rather thick, densely clothed with setose appressed scales. Fronds from under 1 ft. to near 2 ft. long, rather broad, twice or thrice pinnate or pinnatifid. Pinnules coriaceous, ½ to 1½ in. long, the lower larger ones distinct and deeply pinnatifid, the upper ones confluent and obtusely lobed. Sori at the base of the crenatures or lobes. Indusium narrow-oblong, ¾ line long, the margins adnate, forming with the frond a complete cup or tube.—Bedd. Ferns Brit. Ind. t. 104.

Queensland. Hummocky Island, *Thozet.*

Also in the Malayan Archipelago and South Pacific Islands.

2. **D. elegans,** *Swartz; Hook. Spec. Filic.* i. 164, *t.* 43, *Syn. Filic.* 95.—Rhizome thick scaly and woolly. Fronds rather large, 3 or 4 times pinnate, the pinnæ often tapering into long points. Pinnules lanceolate, deeply pinnatifid, coriaceous, smooth shining and elegantly marked with raised striæ distinct from the veins. Sori on small truncate or bidentate lobes or teeth. Indusium ovate, about ½ line long and broad, the margins adnate and forming with the tube a complete cup, the number of these little shining indusia elegantly contrasting with the darker frond.—R. Br. Prod. 157.

Queensland. Endeavour River, *Banks and Solander*, *A. Cunningham*; **York** Peninsula, *N. Taylor*; Rockingham and Cleveland Bays, *W. Hill*, *Dallachy*, *Bowman*; Fitzroy Island, *Walter*; Rockhampton, *O'Shanesy*.

Widely spread over tropical Asia and Africa.

3. **D. pyxidata,** *Cav.*; *Hook. Spec. Filic.* i. 169, *t.* 55, *Syn. Filic.* 96.—Rhizome thick, densely covered with soft scales. Fronds usually under 1 ft. long and nearly as broad, on a stipes half as long, twice or thrice pinnate. Pinnules coriaceous smooth and shining, the lobes and segments shorter and broader than in *D. elegans,* without the raised striæ of that species, the veins slightly depressed. Sori on the lobes or teeth. Indusium ovate, sometimes as broad as in *D. elegans*, but more frequently rather narrower, the margins adnate, when young almost immersed in the frond.—R. Br. Prod. 157.

Queensland. Brisbane River, Moreton Bay, *F. Mueller* and others; Rockhampton and neighbouring districts, *Dallachy*, *Thozet*, *O'Shanesy*; Rockingham Bay, *Dallachy*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, *Fl. Mixt. n.* 240, *A. Cunningham* and others; New England, *C. Stuart*; Richmond River, *Mrs. Hodgkinson*; Hastings and Macleay River, *Beckler*; Illawarra, *Johnson*.

Also in Norfolk Island, and New Caledonia, and scarcely to be distinguished from the well-known *D. canariensis* of the West Mediterranean region.

4. **D. pedata,** *Sm.*; *Hook. Spec. Filic.* i. 154, *t.* 45, *Gard. Ferns*, t. 7, *Syn. Filic.* 89.—Rhizome scaly, often very long. Fronds ovate-triangular, 1½ to 3 in. long, on a stipes usually as long or longer, coriaceous, deeply pinnatifid, the lowest pair of segments usually again pinnatifid and deeply so on the outer side, the others gradually smaller and entire or scarcely crenate, obtuse or truncate. Sori at the base of the crenatures at the end or upper half of the segments. Indusium nearly orbicular, rather above ¼ line diameter, closely appressed and covering the sorus but attached only by the broad base.—*Humata pedata*, J. Sm.; Bedd. Ferns S. Ind. t. 12.

Queensland. Cape York Peninsula, *N. Taylor*; Rockingham Bay, *W. Hill*, *Dallachy*; Bowen, *Woolls*.

Also in tropical Asia and the Mascarene Islands.

5. **D. dubia,** *R. Br. Prod.* 157.—Fronds large, resembling those of *Dicksonia davallioides* but more rigid, twice or thrice pinnate. Pinnules ½ to 1¼ in. long, lanceolate, deeply pinnatifid and the lowest segments often again toothed or lobed, somewhat coriaceous. Sori at the base of the obtuse teeth or lobes which are often curved over them as in *Dicksonia* but quite independent of them. Indusium about ¼ line broad and very short, attached only by the broad base as in *D. pedata*, without any trace of the upper valve or complete ring of *Dicksonia*.—Hook. and Bak. Syn. Fil. 438; Sieb. Filic. Exs. n. 111, Fl.

Mixt. n. 247; *Dicksonia dubia*, Gaudich. in Freyc. Voy. Bot. 367; Hook. Spec. Filic. i. 71, t. 24; Hook. f. Fl. Tasm. ii. 132; *Balantium Brownianum*, Presl, Pteridogr. 134.

Queensland. Moreton Bay, *F. Mueller*; Port Denison and Mount Elliott, *Fitzalan*; Rockingham Bay, *Dallachy*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *A. Cunningham* and others; New England, *C. Stuart*; Hastings River, *Beckler*; Tweed River, *Guilfoyle*; Illawarra, *Johnson*; Lord Howe's Island, *C. Moore*, *Fullagar*.

Victoria. Port Phillip, *R. Brown*; Grampians, *Sullivan*; Dandenong, Apollo Bay, Upper Hume River, etc., *F. Mueller* and others.

Tasmania. Port Dalrymple, *R. Brown*; Mersey River, *Gunn*, *C. Stuart*.

6. **D. speluncæ**, *Baker, Syn. Fil.* 100.—Fronds large, twice or thrice pinnate. Secondary pinnæ lanceolate, 2 to 4 in. long, pinnate in the lower part, pinnatifid towards the end, membranous, hairy underneath as well as the rhachis. Lower pinnules ½ to ¾ in. long, pinnatifid, the upper ones gradually smaller and confluent, reduced towards the end to small lobes. Sori several on each pinnule below the sinus of the lobes, forming 2 rows at some distance from the margin. Indusium broad, short, membranous, slightly toothed or jagged, attached only by the broad base.—*Polypodium speluncæ*, Linn.; *Microlepia speluncæ*, T. Moore; Bail. Queensl. Ferns, 52; *Davallia flaccida*, R. Br. Prod. 157; F. Muell. Fragm. v. 118, *D. polypodioides*, Don; Hook. Spec. Filic. i. 181.

Queensland. Endeavour River, *Banks and Solander*; Broad Sound, *Bowman*: Rockingham Bay, *W. Hill*, *Dallachy*.

Widely spread over tropical Asia and Africa.

7. **D. tripinnata**, *F. Muell. Herb.*—An elegant fern of which I have only seen a single frond in herb. F. Mueller, 8 in. long, 6 in. broad at the base, on a hairy stipes of 6 in., thrice pinnate, the main rhachis hairy. Primary pinnæ lanceolate, secondary oblong ½ to 1 in. long, pinnules 2 to 4 lines, deeply divided into 2 to 4 obovate obtuse lobes dark green on both sides but rather thin, the lower pinnæ and pinnules quite distinct, the upper ones smaller and confluent at the base. Sori few in the specimen under the sinus of some of the smaller lobes. Indusium membranous, broad and somewhat jagged, attached only by the broad base.

Queensland. Bellenden Ker Range, *W. Hill.*

20. VITTARIA, Sm.

Rhizome creeping. Fronds simple, linear, the very oblique veins connected in an intramarginal vein. Sori continuous along the intramarginal vein, with a two-valved indusium of the substance of the frond, opening from the outer margin inwards as an inner valve, the margin of the frond recurved over the sorus forming the outer valve, the sorus thus appearing embedded in a double margin of the frond.

The genus is limited to a very few species dispersed over the tropical regions of the globe, the only Australian one extending over tropical Asia, Africa and the Pacific islands.

1. **V. elongata**, *Swartz ; Hook. and Bak. Syn. Filic.* 395.—Rhizome creeping, covered with black or purple hairlike scales. Fronds varying from 2 or 3 in. to 2 ft. in length, 1 to 2 lines broad when fertile, 2 to 5 lines when barren, acute obtuse or truncate at the end, gradually tapering into a short stipes, of a rather coriaceous texture. Veins very oblique, sometimes almost parallel with the midrib and all as well as the midrib embedded in the substance of the frond.. Sori usually extending nearly the whole length of the fertile fronds. —R. Br. Prod. 153; Leurss. in Schenk and Leurss. Mittheil. Bot. i. 90, t. 11 ; Bedd. Ferns S. Ind. t. 21.

Queensland. Broad Sound, *R. Brown ;* Cape York, *Daemel;* Rockingham Bay, *Dallachy ;* Daintree River and Mount Elliott, *Fitzalan ;* Islands off the coast, *A. Cunningham.*
N. S. Wales. Richmond River, *C. Moore ;* Macleay River, *Fitzgerald.*

21. LINDSÆA, Dryand.

Rhizome creeping or shortly horizontal. Fronds pinnate or compound or in species not Australian undivided. Sori in a continuous or rarely interrupted line under the margin of the frond, with a continuous indusium opening along the upper or outer margin, the margin of the frond sometimes slightly dilated and assuming the appearance of an upper valve. Veins forked, free or anastomosing.

A considerable tropical and subtropical genus, common to the New and the Old World. Of the eleven Australian species five have a wide range in the Old World, two are New Zealand species, one of them also in New Caledonia ; the four others appear to be endemic.

Pinnules obliquely flabellate, one side of the base longer than the inner.
  Rhizome creeping. Fronds simply pinnate ; rhachis black, wiry. Pinnules small, distant . . . . . . 1. *L. linearis.*
  Rhizome short. Fronds tufted, simply pinnate ; rhachis slender. Pinnules small, distant, often bipartite . 2. *L. dimorpha.*
  Rhizome short. Fronds tufted, simply pinnate. Pinnules near together, 3 to 4 lines broad . . . . 3. *L. cultrata.*
  Rhizome creeping. Fronds pinnate and bipinnate. Pinnules often ½ in. broad.
    Veins forked, all free or very rarely anastomosing . . 4. *L. flabellulata.*
    Veins in most of the pinnules more or less anastomosing . . . . 5. *L. lobata.*
Pinnules obovate or cuneate, equilateral. Veins free.
  Fronds mostly bipinnate, rather rigid.

Pinnules obovate or oblong-cuneate, 2 to 3 lines long . . . . 6. *L. trichomanoides.*
Fronds bipinnate, the rhachis slender flexuose. Pinnules cuneate-truncate, 1 to 2 lines long . . . . . . 7. *L. microphylla.*
Fronds very slender, pinnate. Pinnules small deeply divided into 2 or 3 cuneate lobes, 1 to 2 lines long . . . . 8. *L. incisa.*
Primary pinnules entire lanceolate, or pinnate with short secondary pinnules. Veins anastomising.
Primary pinnules ovate-lanceolate, undivided, 4 to 8 lines long . . . . 9. *L. Fraseri.*
Primary pinnules lanceolate, 1 to 4 in. long, entire or wholly or partially pinnate with short secondary pinnules . . . . 10. *L. ensifolia.*
Primary pinnules lanceolate, coriaceous, entire, woolly-tomentose underneath. Veins free . . . . 11. *L. lanuginosa.*

1. **L. linearis,** *Swartz; Hook. Spec. Filic.* i. 206, *Syn. Fil.* 104.—Rhizome creeping, Frond simply pinnate, the stipes and the rhachis wiry, black and glabrous, from 2 or 3 in. to above 1 ft. high. Pinnules distant, very obliquely cuneate or flabellate almost dimidiate, the base very unequal, 3 to 4 lines broad. Sori forming a continuous line under the outer margin.—R. Br. Prod. 156; Hook. f. Fl. Tasm. ii. 136; Kunze in Pl. Preiss. ii. 113, F. Muell. Fragm. v. 119; Sieb. Fl. Mixt. n. 233.

Queensland. Brisbane River, Moreton Bay, *F. Mueller*, *Bailey.*
N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *A. Cunningham*, *Woolls* and others; New England, *C. Stuart*; Hastings River, *Beckler.*
Victoria. Dry forest land in the western districts common, *Robertson*, *F. Mueller* and others.
Tasmania. Abundant in heathy places, *J. D. Hooker.*
S. Australia. Onkaparinga, *F. Mueller.*
W. Australia. King George's Sound to Swan River, *Oldfield*, *Drummond*, *n.* 226, 401, *Preiss*, *n.* 1306, and others.

Also in New Zealand, New Caledonia and Norfolk Island.

2. **L. dimorpha,** *Bail. Queensl. Ferns,* 19.—Rhizome tufted. Fronds simply pinnate, the barren ones mostly 2 in. long or rather more, with a few broad flabellate pinnules toothed and shortly lobed, scarcely oblique. Fertile fronds much longer, the stipes and rhachis very slender and pale-coloured. Pinnules either broadly flabellate very oblique and undivided as in *L. linearis* or once or twice bipartite as in *L. incisa.*—*L. heterophylla,* Prent. in Trim. Journ. Bot. 1873, 295, not of Dryand.

Queensland. Near Brisbane, *Prentice*, *Bailey.* A very distinct species readily recognised by the slender tufted fronds, although the fertile fronds in the specimens seen are not very perfect.

3. **L. cultrata,** *Swartz; Hook. Spec. Filic.* i. 203, *Syn. Filic.* 105.—Rhizome tufted or very shortly creeping. Fronds simply pinnate, 3

to 6 in. long, the stipes and rhachis wiry but slender and pale-coloured. Pinnules near together, occupying the greater part of the frond, very oblique or half-reniform, 3 to 4 lines broad, the rounded outer margin entire, with the sorus and indusium continuous or slightly lobed or denticulate interrupting the sori. –Hook. and Grev. Ic. Filic t. 144 (a larger state than the Australian specimens); Bedd. Ferns S. Ind. t. 23; *Davallia brachypoda,* Baker, Syn. Filic. 468; *Lindsæa concinna,* J. Sm.; Bail. Queensl. Ferns, 18.

Queensland. York Peninsula, *Hahn's Expedition, N. Taylor;* Bellenden Ker Range. *W. Hill;* Gilbert River, *Daintree.*

Also in the Mascarene Islands and tropical and eastern Asia up to Japan.

4. **L. flabellulata,** *Dryand. in Trans. Linn. Soc.* iii. 41, *t.* 8.—Rhizome creeping. Fronds 6 in. to 1 ft. high, usually bipinnate 2 or more of the lower pinnæ being again pinnate and 2 to 4 in. long, the upper pinnæ entire, but sometimes the whole frond simply pinnate or in other specimens more or less tripinnate. Pinnules oblique, in the simply pinnate part flabellate or almost rhomboid often ½ in. broad, smaller in the more compound specimens. Veins forked, free or very rarely here and there anastomosing. Sori continuous round the margin or interrupted.—*L. tenera,* Dryand.; F. Muell. Fragm. v. 119; *L. media,* R. Br. Prod. 156; *L. polymorpha,* Hook. and Grev. Ic. Filic. t. 75.

N. Australia. Islands off the North Coast, *R. Brown;* Port Essington, *Armstrong.*

Queensland. York Peninsula, *N. Taylor;* Rockingham Bay, *Dallachy;* Bellenden Ker Range, *W. Hill;* Islands off the coast, *A. Cunningham, M'Gillivray.*

Also in East India and the Malayan Archipelago.

5. **L. lobata,** *Poir.; Hook. and Bak. Syn. Filic.* 111.—Rhizome creeping. Fronds 6 in. to 1 ft. high, simply pinnate or bipinnate with few pinnate pinnules at the base, much resembling the less-branched specimens of *L. flabellulata,* but the fertile pinnules often more than ½ in. broad, and the veinlets frequently anastomosing.

Queensland. Endeavour and Bloomfield Rivers, *N. Taylor;* Rockingham Bay, *Dallachy;* Hull River, *W. Hill.*

Also in East India, the Malayan Archipelago and the South Pacific Islands.

6. **L. trichomanoides,** *Dryand. in Trans. Linn. Soc.* iii. 43, *t.* 11.—Rhizome creeping. Fronds rather rigid, 6 in. to near 1 ft. high, including the long wiry stipes, bipinnate. Primary pinnæ almost opposite, usually ½ to 1 in. long; pinnules obovate or oblong-cuneate,

æquilateral, 2 to 3 lines long, the upper ones confluent, all rounded and entire at the end with a continuous sorus, or notched with an interrupted sorus and indusium. Veinlets forked, not anastomising.—Hook. Sp. Filic. i. 218, Syn. Filic. 110; Hook. f. Fl. Tasm. ii. 136; F. Muell. Fragm. v. 118.

N. S. Wales ? Illawarra, *Herb. F. Mueller*, collector not named; Kurrajong, *Woolls*, a small doubtful specimen.
Tasmania. Dense forests near Macquarrie Harbour, *Milligan, Gunn.*

Also in New Zealand.

7. **L. microphylla,** *Swartz; Hook. Spec. Filic.* i. 218, *Syn. Filic.* 110.—Rhizome knotted, shortly creeping. Fronds 6 in. to 1 ft. or rarely 1½ ft. high, bipinnate, the main rhachis wiry but slender, usually flexuose. Primary pinnæ ½ to 1 in. or the lower ones nearly 2 in. long. Barren pinnules varying from ovate to lanceolate, toothed or lobed; fertile ones obovate cuneate or almost fan-shaped, equilateral, 1 to 2 or rarely 3 lines broad, undivided with a continuous sorus, or notched or lobed with the sori interrupted.—Hook. and Grev. Ic. Filic. t. 194; Sieb. Fl. Mixt. n. 234; F. Muell. Fragm. v. 119.

Queensland. Brisbane River, Moreton Bay, *Fraser, F. Mueller.*
N. S. Wales. Port Jackson, *R. Brown, A. Cunningham;* Clarence River, *Wilcox;* New England, *C. Stuart.*

8. **L. incisa,** *Prent. in Trim. Journ. Bot.* 1873, 295.—Very near *L. microphylla*, with the same creeping rhizome, but the stipes and rhachis very slender and pale-coloured. Pinnules small, the fertile ones and most of the barren ones divided to the rhachis into 2 or 3 cuneate segments 1 to 2 lines long, and usually the barren pinnules on the same rhachis as the fertile ones and below them.

Queensland. Damp shaded places near Brisbane, *Prentice, Bailey.*

9. **L. Fraseri,** *Hook. Spec. Filic.* i. 221, *t.* 70, *Syn. Filic.* 112.—Rhizome creeping. Fronds with a short stipes erect, simply pinnate, ¾ to 1½ ft. high. Pinnules distant, from almost ovate to lanceolate, equilateral, obtuse, truncate or cordate at the base and shortly petiolate, mostly 4 to 8 lines long, the upper ones smaller and obovate or rhomboidal, and the barren ones often larger and denticulate, the veinlets frequently anastomosing. Sori marginal, continuous or slightly interrupted.—*Schizoloma Fraseri*, J. Sm.; Bail. Queensl. Ferns, 20.

Queensland. Vicinity of Moreton Bay, *Fraser, Leichhardt, A. Cunningham, F. Mueller.*

10. **L. ensifolia,** *Swartz; Hook. Spec. Filic.* i. 220, *Syn. Filic.* 112. —Rhizome creeping. Fronds simply pinnate, 6 in. to above 1 ft. high. Pinnules exceedingly variable in number size and shape, the barren ones at the base often small, irregularly ovate or obovate but sometimes

lanceolate like the fertile ones, serrulate, rarely lobed; fertile ones in the middle sometimes only 2 or 3, sometimes nearly 20, lanceolate, 1 to 4 in. long, the frond ending in a long lanceolate lobe occasionally broken up into small obovate segments. Veins more or less anastomosing. Sori continued along the whole margin except the short equally cuneate base.—Hook. and Grev. Ic. Filic. t. 111; F. Muell. Fragm. v. 118; *L. lanceolata*, Labill. Pl. Nov. Holl. ii. 98, t. 248; R. Br. Prod. 156; *L. pentaphylla*, Hook. Spec. Filic i. 219, t. 67; *Schizoloma ensifolium*, J. Sm.; Bedd. Ferns S. Ind. t. 25.

N. Australia. North-coast Islands, *R. Brown;* Hunter's River, York Sound, *A. Cunningham;* Fitzmaurice River, *F. Mueller;* Port Darwin, *Schultz, n.* 36, 209.

Queensland. Shoalwater Bay and Port Bowen, *R. Brown;* Cape York, *Daemel;* Albany Island, *F. Mueller;* Daintree River, *Fitzalan;* Gilbert River, *Daintree;* Mount Wheeler, *Thozet;* Moreton Bay, *W. Hill, F. Mueller.*

Also in the Mascarene Islands, East India, the Malayan Archipelago and South Pacific Islands. Labillardière gives Cape Van Dieman (Tasmania) as the station for his plant. No other collector however has found it there, and it is omitted in J. D. Hooker's Flora. In Hook. Sp. Filic. Labillardière's station is given as North Coast, which Labillardière did not visit. There is no doubt however of the identity of his plant with the common tropical species.

Var. *heterophylla.* A few or many or all the pinnæ elongated and wholly or partially divided into small pinnules or segments.—Carpentaria Islands, *R. Brown;* York Peninsula, *N. Taylor;* Cape York, *Daemel;* Rockingham Bay, *Dallachy, W. Hill;* Daintree River, *Fitzalan.*

Baker is disposed to identify this variety with the Asiatic *L. heterophylla*, Dryand., which is certainly very near it, but with the pinnules usually longer and of a firmer texture.

11. **L. lanuginosa,** *Wall.; Hook. Spec. Filic.* i. 210, *t.* 69, *Syn. Filic.* 109.—Rhizome stout, creeping. Fronds 1 to about 2 ft. long, simply pinnate, the rhachis densely woolly-tomentose, or the wool at length deciduous. Pinnæ numerous, lanceolate, often falcate, 1¼ to 2½ in. long, not quite sessile, coriaceous, glabrous above, woolly-tomentose underneath at least when young, the fertile ones almost acuminate, the lower barren ones rounded at the end. Veins simple or forked, diverging from the midrib and all free. Sori continuous along the margins except the obliquely truncate base.—F. Muell. Fragm. v. 118.

Queensland. Rockingham Bay, *W. Hill;* Edgecombe Bay, *Dallachy;* Port Denison and Daintree River, *Fitzalan.*

Spread over tropical Asia and Africa.

22. ADIANTUM, Linn.

Rhizome creeping or tufted. Fronds compound or rarely simple. Pinnules more or less petiolate, often oblique, the forked or dichotomous veins radiating from the petiole to the margin without any midrib.

Sori marginal, short and distinct or rarely elongated and confluent. Indusium continuous with the margin and recurved bearing the spore-cases on its under surface.

A large genus, widely spread over the tropical and temperate regions of the New and the Old World. Of the seven Australian species three are common to the New and the Old World, two extend from New Zealand to tropical Asia and the Pacific Islands, one of them also into Africa, the two remaining ones only into New Zealand, none of them endemic in Australia.

Fronds simply pinnate. Pinnules on long petioles ½ to 1 in. broad. Sori almost continuous . . . . . 1. *A. lunulatum.*
Fronds bipinnate. Pinnules broad divided into cuneate lobes. Sori transversely oblong . . . . . . 2. *A. capillus-veneris.*
Fronds mostly 3-pinnate. Pinnules broadly obovate nearly equal at the base. Indusia reniform . . . 3. *A. æthiopicum.*
Fronds bipinnate or 3-pinnate at the base. Pinnules very oblique or dimidiate. Rhizome creeping.
  Pinnæ numerous. Pinnules mostly 3 to 4 lines broad. Sori and indusia transversely oblong . 4. *A. formosum.*
  Pinnæ fewer. Pinnules more equal, 4 to 8 lines broad.
    Indusia reniform . . . . 5. *A. affine.*
    Indusia transversely oblong . . . . var. *intermedium.*
Fronds with few long almost pedate glabrous pinnæ. Pinnules membranous, finely veined. Sori in the sinus, reniform. Rhizome tufted . . . . . . 6. *A. diaphanum.*
Fronds more pedate, more or less hispid. Pinnules prominently veined. Sori rounded, contiguous. Rhizome usually tufted . . . . 7. *A. hispidulum.*

1. **A. lunulatum**, *Burm.; Hook. Spec. Filic.* ii. 11, *Syn. Filic.* 114.—Rhizome short. Fronds tufted, simply pinnate, 6 in. to near 1 ft. long, the rhachis wiry, very slender. Pinnules articulate on slender petioles of 1 to 4 lines, obliquely fan-shaped, ½ to 1 in. broad. Sori elongated, sometimes continuous along the whole outer margin, but often more or less interrupted.—Hook. and Grev. Ic. Filic. t. 104.

N. Australia. Port Darwin, *Schultz*, *n.* 152, 212.
Queensland. Rockingham Bay, *Dallachy.*

Spread over the tropical regions of the New and the Old World.

2. **A. capillus-veneris**, *Linn.; Hook. Spec. Filic.* ii. 36, *Syn. Filic.* 123.—Rhizome creeping. Fronds bipinnate, broadly ovate in outline, 6 in. to 1 ft. long and sometimes nearly as broad, the rhachis capillary. Pinnules on short capillary petioles, broadly obovate or obliquely fan-shaped, 4 to 8 lines broad, more or less divided into cuneate obtuse or truncate lobes, thin, of a bright green. Sori at the end of most of the lobes usually occupying their whole breadth.—Hook. Brit. Ferns, t. 41; Bedd. Ferns S. Ind. t. 4.

Queensland. Wet rocks near Northampton, *O'Shanesy.*

Common in the temperate and subtropical regions of the globe especially in the northern hemisphere, less abundant within the tropics.

3. **A. æthiopicum,** *Linn.; Hook. Spec. Filic.* ii. 37, *t.* 77. *Syn. Filic.* 123.—Rhizome tufted or stoloniferous. Fronds usually 1 to 1½ ft. high, 4 to 8 in. broad, twice three or four times pinnate, the rhachis slender shining, often flexuose. Pinnules on short petioles, mostly obovate-orbicular with a more or less cuneate equal base, 3 to 5 lines broad, thin and bright green, broadly crenate or very shortly lobed. Sori distinct in the sinus of the crenatures, the reflexed indusium reniform or at length transversely oblong.—Bedd. Ferns S. Ind. t. 5; Hook. f. Fl. Tasm. ii. 137; F. Muell. Fragm. v. 119; Sieb. Fl. Mixt. n. 244; *A. assimile*, Swartz; Hook. Spec. Filic. ii. 37; R. Br. Prod. 155; *A. trigonum*, Labill. Pl. Nov. Holl. ii. 99, t. 248.

Queensland. Broad Sound, Shoalwater and Keppel Bay, *R. Brown;* York Peninsula, *N. Taylor;* Rockingham Bay, *Dallachy;* very numerous localities in southern Queensland, *Bowman, O'Shanesy* and others; Maranoa in the interior, *Mitchell.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Woolls* and others; northward to New England, *C. Stuart;* Hastings and Macleay Rivers, *Beckler;* southward to Twofold Bay, *L. Morton;* Lord Howe's Island, *Fullagar.*

Victoria. Very common from Wendu Vale, *Robertson*, and the Grampians to Gipps' Land, *F. Mueller* and others.

Tasmania, *Labillardière;* Pasture lands and rocky places frequent, *J. D. Hooker.*

S. Australia. Kangaroo Island, *R. Brown;* Lofty Ranges, *F. Mueller.*

W. Australia. King George's Sound to Swan River, *Preiss, n.* 1308; *Drummond, n.* 995 and others.

Widely dispersed over the tropical and temperate regions of the Old World and of Western America.

4. **A. formosum,** *R. Br. Prod.* 155.—Rhizome creeping, scaly. Fronds 1 to 3 ft. high, broadly spreading, 2 to 4 times pinnate, the stipes often scabrous with numerous pinnæ, the primary and secondary ones always simply pinnate at the end, the main rhachis usually flexuose slender and black. Pinnules membranous or scarcely coriaceous, shortly petiolate, obliquely oblong obovate or rhomboidal, usually 3 to 4 lines rarely only 2 lines long, or larger when barren, the entire sides very unequal, the fruiting margin crenate-toothed. Sori on the teeth or between them. Indusium transversely oblong or somewhat reniform. —Hook. Spec. Filic. ii. 51, t. 86, Syn. Filic. 119; F. Muell. Fragm. v. 120.

Queensland. Port Denison, *Fitzalan;* Moreton Bay, *Leichhardt* and others; Ipswich, *Nernst.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and many others; New England, *C. Stuart;* Richmond River, *C. Moore* and others; Clarence and Hastings Rivers, *Beckler;* Illawarra, *Johnson.*

Victoria. Broadrib and Snowy Rivers, *F. Mueller.*

Also in New Zealand.

5. **A. affine,** *Willd.; Hook. and Bak. Syn. Fil.* 117.—Near *A. formosum*, but much less divided, with larger pinnules more equal in size. Rhizome creeping. Fronds 1 ft. high or more, bipinnate or

tripinnate only in the lower part, Primary pinnæ not numerous, 3 to 6 in. long. Pinnules almost sessile, very obliquely ovate or oblong-rhomboidal, 4 to 8 lines broad, the outer margins dentate. Sori marginal, scarcely indented. Indusium broadly reniform.—F. Muell. Fragm. v. 119; *A. Cunninghamii*, Hook. Spec. Filic. ii. 52, t. 86.

Queensland. Maroochie, *Bailey*.
N. S. Wales. Port Jackson to the Blue Mountains, *Woolls* and others; Richmond River, *C. Moore*; Macleay River, *Fitzgerald*.

Also in New Zealand.

Var. *intermedium*. Fronds and pinnules of *A. affine*, but the indusia transversely oblong as in *A. formosum*.—Rockingham Bay, *Dallachy*; Port Jackson to the Blue Mountains, *Woolls*.

6. **A. diaphanum**, *Blume; Hook. Spec. Filic.* ii. 10, *t.* 80, *Syn. Filic.* 117.—A much smaller and more delicate plant than *A. affine*. Rhizome tufted. Fronds 6 in. to 1 ft. high including the slender stipes, with 2 to 5 primary pinnæ 3 to 6 in. long, the lower ones sometimes with 1 or 2 secondary ones at the base. Pinnules numerous, very shortly petiolate, obliquely ovate-rhomboidal with very unequal bases, thinly membranous, 3 to 6 lines broad, the outer margin dentate. Sori in the sinus of the teeth. Indusium deeply reniform.—*A. affine*, Hook. Spec. Filic. ii. 32, not of Willd.

Queensland. Rockingham Bay, *Dallachy*; Daintree River, *Fitzalan*; southern districts, *Leichhardt*, *Hartmann*.
N. S. Wales. Richmond River, *C. Moore*.

Also in the Malayan Archipelago, South China, the South Pacific Islands and New Zealand.

7. **A. hispidulum**, *Swartz; Hook. Spec. Filic.* ii. 31, *Syn. Filic.* 126—Rhizome tufted or rarely creeping. Fronds when perfect once or twice forked at the base, each branch ending in a long pinna or pinnately divided at the base or higher up into secondary pinnæ. Pinnules numerous, very shortly petiolate, obliquely ovate-rhomboid, 3 to 8 lines long or broad, rather rigid, prominently veined, the under surface as well as the rhachis more or less hispid. Sori usually almost contiguous though not confluent. Indusia much recurved, orbicular, slightly reniform.—Bedd. Ferns S. Ind. t. 3; F. Muell. Fragm. v. 120.

Queensland. Shoalwater Bay, *R. Brown*; very numerous stations from York Peninsula, *N. Taylor*, and Rockingham Bay, *Dallachy* and others, to Brisbane River, *F. Mueller* and others; and in the interior on the Maranoa, *Mitchell*.
N. S. Wales. Port Jackson to the Blue Mountains. *R. Brown* and others; northward to the Queensland frontier from numerous collectors; southward to Twofold Bay, *F. Mueller*; Lord Howe's Island, *C. Moore*, *Fullagar*.
Victoria. Genoa River, *F. Mueller*.

Extends over tropical Asia and Africa, the Pacific Islands and New Zealand.

23. HYPOLEPIS, Bernh.

Rhizome creeping. Fronds compound, usually large, the pinnules penniveined. Sori marginal, short, in the sinus of the teeth of the pinnules. Indusium a small scale continuous with the margin, recurved over the sorus, the spore-cases attached at its base.

The genus comprises but few species dispersed over the tropical and subtropical regions of the New and the Old World, the only Australian species being limited to the Old World.

1. **H. tenuifolia,** *Bernh.; Hook. Spec. Filic.* ii. 60, t. 89, 90, *Syn. Filic.* 129.—Fronds 4 to 5 ft. high including the stipes and often above 1 ft. broad, 3 or 4 times pinnate. Tertiary pinnæ lanceolate, deeply pinnatifid or pinnate; fruiting pinnules or segments 2 to 4 lines long, crenate-toothed. Rhachis and under side of the segments usually slightly hairy. Sori few or several to each segment in the sinus of the teeth, the reflexed scale-like indusium at first often covering the sorus but in an advanced stage almost concealed under the sorus or quite withered away.

Queensland. Rockingham Bay, *Dallachy;* Daintree River, *Fitzalan.*
N. S. Wales. Richmond River, *C. Moore;* Lord Howe's Island, very abundant, *C. Moore, Fitzgerald* and others.

Also in the Malayan Archipelago, the South Pacific Islands and New Zealand, but not in Tasmania. The fronds, especially in an advanced state of fructification, bear a striking resemblance to those of *Polypodium rugulosum*, and are sometimes confounded with it in herbaria, but, if the insertion of the sori be carefully examined, the two plants will I believe always be readily distinguished.

24. CHEILANTHES, Swartz.

Rhizome tufted or creeping. Fronds usually small, twice or thrice pinnate with small lobed segments. Sori globular and distinct at the end of the veinlets or oblong by the confluence of 2 or more, all marginal, the slightly altered teeth or lobes bent over them and forming an indusium with the spore-cases inserted at their base as in *Pteris*. Veinlets forked from a central nerve.

A considerable genus widely spread over the tropical and temperate regions of the New and the Old World, scarcely differing from *Pteris* in the greater distinctness of the sori. Of the two Australian species one is Asiatic, the other, if truly distinct, is endemic.

Ultimate lobes of the fronds obovate or oblong 1 to 2 lines long, or rarely ovate-lanceolate and larger . . . . . 1. *C. tenuifolia.*
Pinnules ending in a linear lobe usually about ½ in. long . . 2. *C. caudata.*

(See also Notholæna, where the margin forms a spurious indusium.)

1. **C. tenuifolia,** *Swartz; Hook. Spec. Filic.* ii. 82, t. 87, *Syn. Filic.* 138.—Rhizome horizontal or shortly creeping often knotty. Fronds from 2 or 3 in. to nearly 1 ft. high, from narrow lanceolate to

broadly ovate-triangular in outline, the stipes and main rhachis glabrous or scaly-hairy. Primary pinnæ nearly opposite in distinct pairs, exceeding variable in form and division, from under ½ in. long with few entire ovate segments, to above 2 in. long and broad, elegantly pinnate a second and a third time, the tertiary pinnules deeply pinnatifid, the ultimate segments in all cases ovate or oblong obtuse 1 to 2 lines long, with every intermediate between these extremes, or rarely the primary segments ovate-lanceolate obtuse ½ in. long and scarcely lobed, the whole pinnæ quite flat or with a very crisped aspect from the recurved or revolute margins. Sori usually numerous round the margins, nearly contiguous, with the small rounded teeth or lobes bent over them.—R. Br. Prod. 155; Sieb. Filic. Exs. 116, Fl. Mixt. n. 250; Kunze in Pl. Preiss. ii. 111; Hook. f. Fl. Tasm. ii. 138; F. Muell. Fragm. v. 122; Bedd. Ferns S. Ind. t. 188; *C. Sieberi*, Kunze in Pl. Preiss. ii. 112; Hook. Spec. Filic. ii. 83, t. 97; *C. Preissiana*, Kunze l. c.; *C. contigua*, Bak. Syn. Filic. 476; *Pteris nudiuscula*, R. Br. Prod. 155; *Pellæa nudiuscula*, Hook. Spec. Filic. ii. 151.

N. Australia. Islands off the North Coast, *R. Brown;* Victoria River and Sea Range, *F. Mueller;* Escape Cliffs, *Hullse;* Port Darwin, *Schultz, n.* 35, 207, 307, some specimens above 1 ft. long,

Queensland, N. S. Wales (including Lord Howe's Island), **Victoria, Tasmania, S. and Central Australia, W. Australia.** Evidently very abundant especially in stony rocky situations throughout these colonies, the stations indicated far too numerous to particularise, the western ones including *Drummond's n.* 498, and *Preiss's n.* 1304, 1305, 1307, and collected in all except Tasmania by *R. Brown.*

The species extends over East India chiefly in hilly districts, Eastern Asia and the Malayan Archipelago. Some specimens, including *Cheilanthes hirsuta*, Metten., come very near to some of *Notholæna villea*, especially when the fructification is advanced and the indusium opened out.

2. **C. caudata,** *R. Br. Prod.* 156.—Perhaps a variety of *C. tenuifolia*, but the few specimens seen have a very different aspect. Fronds 6 to 8 in. long, slender, bipinnate at least at the base, the pinnæ not numerous, all whether primary or secondary ending in a narrow-linear pinnule, usually at least ½ in. long, continuous or interrupted at the base, and soriferous throughout, the few segments at the base of the pinnæ shortly linear.

Queensland. Endeavour River, *Banks and Solander;* Port Bowen, *R. Brown;* Gilbert River, *Daintree.*

Pteris nitida, R. Br. Prod. 155, (*Pellæa nitida*, Bak. Syn. Filic. 478), is probably this plant. There was no specimen so named found in his herbarium, but from his diagnosis it would appear that he had at first placed it in *Pteris* next to *P. nudiuscula* (which proves to be the *Cheilanthes tenuifolia*), and in subsequently transferring the two to *Cheilanthes* he had accidentally omitted to erase them from *Pteris.*

25. PTERIS, Linn.

Rhizome short and thick or creeping. Fronds usually large and compound rarely small or simple. Veins simple forked or reticulate,

with or without a midrib. Sori linear, continuous or slightly interrupted along the margin of the segments, with a continuous narrow membranous indusium proceeding from the margin and opening along the inner or lower edge. Spore-cases inserted on the frond under the indusium.

A large genus distributed over the temperate as well as the tropical regions of the globe. Of the twelve Australian species five have a general distribution in both the New and the Old World, four are limited to the Old World, two more to New Zealand and the South Pacific Islands, one only is as far as known endemic.

Veins oblique on the midrib, forked and free, but almost concealed in the thick substance of the frond.
Fronds 2 to 4 in. long and broad, 3-partite with deeply pinnatifid divisions . . . . 1. *P. geraniifolia.*
Fronds 6 to 18 in. long, simply pinnate with distinct not decurrent undivided pinnules.
Rhachis usually glabrous. Pinnules broad, 1½ to 2½ in. long, shortly petiolate . . . . 2. *P. paradoxa.*
Rhachis scaly-hirsute.
Pinnules lanceolate, 1 to 2 in. long, sessile . . . 3. *P. falcata.*
Pinnules orbicular or broadly oblong, very obtuse, ½ to ¾ in. long . . . . 4. *P. rotundifolia.*
Veins transverse on the midrib, simple or forked, free, apparent on the membranous frond.
Fronds pinnate.
Pinnæ numerous, narrow, undivided, 3 to 6 in. long 5. *P. longifolia.*
Pinnæ few, narrow, 2 to 4 in. long, undivided or with few short lateral lobes; barren pinnules short and broad . . . . 6. *P. ensiformis.*
Pinnæ many, narrow, 4 to 6 in. long, some undivided others with few lobes . . . . 7. *P. umbrosa.*
Pinnæ 4 to 8 in. long, deeply pinnatifid with numerous narrow segments . . . . 8. *P. quadriaurita.*
Fronds large, 2 to 4 times pinnate, segments decurrent.
Segments glabrous narrow, rather regular. Indusium not thickened at the base . . . . . 9. *P. tremula.*
Segments often very unequal, usually hairy underneath between the raised midrib and the sorus. Indusium from a thickened base . 10. *P. aquilina*, var.
Veins from an irregular midrib oblique branched occasionally anastomosing. Frond large compound . . 11. *P. incisa.*
Veins copiously reticulate on each side of the midrib (**Litobrochia**). Frond-branches pinnate. Pinnæ deeply pinnatifid.
Frond 3-partite. Segments of the pinnæ connected by a uniform winged rhachis 2 to 3 lines broad . . 12. *P. marginata.*
Frond with several branches. Segments of the pinnæ decurrent on the rhachis . . . . 13. *P. comans.*

1. **P. geraniifolia,** *Raddi. Filic. Bras.* 46.—Rhizome tufted. Fronds broadly rounded-cordate in outline, 2 to 4 in. long and broad, coriaceous, tripartite, the lateral divisions divaricate, all deeply pinnatifid, the lower segments again pinnatifid, the upper ones short and entire; lobes all obtusely lanceolate or ovate, with a black midrib sometimes shortly conspicuous, the veins otherwise oblique and forked concealed in the

substance of the frond. Sori continuous on the lobes.—Bedd. Ferns S. Ind. t. 37; F. Muell. Fragm. v. 124; *P. pedata,* R. Br. Prod. 155, not of Linn.; *P. Brownii,* Desv. in Mem. Soc. Linn. Par. vi. 294; *Pellæa geraniæfolia,* Fée; Hook. Ic. Pl. t. 915, Spec. Filic. ii. 132, Syn. Filic. 146.

Queensland. Broad Sound, *R. Brown;* Rockingham Bay, *Dallachy;* Port Denison, *Fitzalan;* Rockhampton, *O'Shanesy, Bowman;* Bowen, *Woolls.*
N. S. Wales. New England, *C. Stuart.*

Widely dispersed over the tropical and subtropical regions of the New and the Old World.

2. **P. paradoxa,** *Baker.*—Rhizome creeping. Fronds 6 in. to 1½ ft. high, simply pinnate, the rhachis dark and shining, glabrous or very rarely with a few scales. Pinnæ very few on young plants, often above 20 in luxuriant fronds, shortly petiolate, lanceolate or ovate-lanceolate, 1½ to 2½ in. long and usually broader than in *P. falcata,* coriaceous, with dichotomous free veins oblique on the midrib concealed in the substance of the frond. Sori usually continuous all round very nearly to the petiole. Indusium not so thin as in most species, soon concealed under the sori.—*Adiantum paradoxum,* B. Br. Prod. 155; Sieb. Fl. Mixt. n. 269: *Pellæa paradoxa,* Hook. Spec. Filic. ii. 135, t. 111, Syn. Filic. 152; *Platyloma Brownii,* J. Sm.; Bail. Queensl. Ferns, 36.

Queensland. Brisbane River, Moreton Bay, *A. Cunningham, F. Mueller* and others; Port Denison, *Fitzalan.*
N. S. Wales. Port Jackson, *R. Brown;* New England, *C. Stuart;* Richmond River, *C. Moore, Ramsay;* Tweed River, *Guilfoyle.*

Included by F. Mueller, Fragm. v. 123, under *P. falcata,* but although not generically separable it appears to me quite distinct as a species.

3. **P. falcata,** *R. Br. Prod.* 154.—Rhizome creeping. Fronds 6 in. to 1½ ft. long, simply pinnate, the rhachis densely scaly-hirsute. Pinnæ numerous, sessile or nearly so, lanceolate, often falcate, 1 to 2 in. long, acute or rather obtuse, coriaceous with the concealed venation of *P. paradoxa,* the lower ones rarely auriculate at the base on the upper side. Sori continuous all round except the truncate base.—Hook. f. Fl. Tasm. ii. 139; Sieb. Syn. Filic. n. 109, Fl. Mixt. n. 253; F. Muell. Fragm. v. 123, partly; *Pellæa falcata,* Fée; Hook. Spec. Filic. ii. 135, t. 111, Syn. Filic. 151; *P. seticaulis,* Hook. Ic. Pl. t. 207; *Platyloma falcatum,* J. Sm.; Bedd. Ferns S. Ind. t. 22.

Queensland. Brisbane River, Moreton Bay, *A. Cunningham;* Port Denison, *Fitzalan;* Rockhampton and neighbouring districts, *Bowman, O'Shanesy* and others.
N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, A. Cunningham* and others: northward to New England, *C. Stuart;* Hastings River, *Beckler;* Tweed River, *Guilfoyle;* southward to Illawarra, *Johnson;* Twofold Bay, *F. Mueller;* Lord Howe's Island, *C. Moore, Fullagar.*
Victoria. From Melbourne and the Grampians to East Gipps' Land, *F. Mueller* and many others.
Tasmania. Kent's Island, *R. Brown;* common in forests, etc., *J. D. Hooker.*

Also in East India, the Malayan Archipelago and New Zealand.

4. **P. rotundifolia,** *Forst.; Hook. Ic. Pl. t.* 422.—Habit of *P. falcata* but usually smaller or more slender. Pinnæ orbicular or very broadly oblong, obtuse, often slightly cordate at the base, almost sessile, usually about ½ in. long or when luxuriant ¾ in. Venation and scaly hirsute rhachis entirely as in *P. falcata.*—*Pellæa rotundifolia*, Hook. Spec. Filic. ii. 136, Syn. Filic. 151; *Platyloma rotundifolium*, J. Sm.; Bail. Queensl. Ferns, 36.

Queensland. Mount Dryander, *Fitzalan*, also Mount Lindsey, *Bailey* (whose specimens I have not seen).

Also in New Zealand and in Norfolk Island. The figure in Hooker's Filic. Exot. t. 48, represents a luxuriant large form probably from a cultivated specimen.

5. **P. longifolia,** *Linn.; Hook. Spec. Filic.* ii. 157, *Syn. Filic.* 153.—Rhizome short and thick. Fronds 1 to 2 ft. high, simply pinnate, the stipes scaly-hairy at the base only. Pinnæ usually numerous, sessile or nearly so, linear or linear-lanceolate, 3 to 6 in. long in full-grown specimens, the simple or forked veins transverse from the midrib and apparent. Sori continuous along the whole margin except the small rounded or cordate base.—F. Muell. Fragm. v. 126; Bedd. Ferns S. Ind. t. 33.

Queensland. Brisbane River, Moreton Bay, *F. Mueller;* Rockhampton, *Bowman, Thozet, O'Shanesy.*

N. S. Wales. Blue Mountains, *Mrs. Calvert;* New England, *C. Stuart;* Shoalhaven, *C. Moore,*

Victoria. Mitchell and Buchan Rivers, Gipps' Land, *F. Mueller.*

Widely spread over the tropical and temperate regions of the globe.

6. **P. ensiformis,** *Burm. Fl. Ind.* 230, *Thes. Zeyl. t.* 87.—Rhizome creeping. Fronds 9 to 16 in. high, pinnate, the stipes without scales. Pinnæ when fertile usually linear, entire or the lower ones or nearly all lobed or again pinnate at the base, the terminal lobe often 2 to 4 in. long, the lateral ones short, often shortly decurrent; lobes of the barren fronds or pinnæ oblong or ovate and denticulate; veins forked, transverse from the midrib. Sori continuous round the fertile lobes.—Hook. and Bak. Syn. Filic. 155; *P. crenata*, Swartz; Hook. Spec. Filic. ii. 163, t. 127; R. Br. Prod. 154; F. Muell. Fragm. v. 125.

Queensland. Endeavour River, *Banks and Solander;* York Peninsula, *N. Taylor;* Port Denison, *Fitzalan.*

Ranges over tropical and Eastern Asia and the Pacific Islands.

7. **P. umbrosa,** *R. Br. Prod.* 154.—Rhizome thick and knotted or shortly creeping. Fronds attaining 2 or 3 ft., pinnate, the stipes often slightly scabrous. Pinnæ 13 to 21, linear-lanceolate, 4 to 6 in. long, entire or the lower ones again divided into 3 to 5 similar segments, all more or less decurrent on the rhachis, usually broader and minutely serrulate when barren, and the barren ends of fertile ones often deeply serrate; veinlets transverse, mostly forked. Sori continued down the decurrent base.—Hook. Spec. Filic. ii. 162, t. 130, Syn. Filic. 155; F. Muell. Fragm. v. 126; Sieb. Syn. Filic. n. 128.

Queensland. Brisbane River, Moreton Bay, *F. Mueller;* Dalrymple Creek, *Hartmann.*

N. S. Wales. Grose River, *R. Brown;* Blue Mountains, *Mrs. Calvert;* New England, *C. Stuart;* Hastings, Clarence and Macleay Rivers, *Beckler;* Tweed River, *Guilfoyle;* southward to Illawarra, *A. Cunningham;* Twofold Bay, *F. Mueller.*

Victoria. Genoa River, *F. Mueller.*

8. **P. quadriaurita,** *Retz; Hook. Spec. Filic.* ii. 179, *t.* 134, *Syn. Filic.* 158.—Rhizome thick. Fronds pinnate, varying from 1 to 3 ft. long. Pinnæ mostly opposite, 4 to 8 in. long, regularly and deeply pinnatifid, otherwise undivided or the lower ones with one or two similar secondary pinnæ on the lower side. Pinnules or segments numerous, broadly linear, often falcate, obtuse, 4 to 8 lines long, confluent at the base, the pinnæ usually ending in a long linear-lanceolate point lobed at the base. Sori often not reaching the base of the segments.—Bedd. Ferns S. Ind. t. 31; F. Muell. Fragm. v. 125.

Queensland. Cape York Peninsula, *Hahn's Expedition, N. Taylor;* Rockingham Bay, *W. Hill, Dallachy;* Daintree River, *Fitzalan.*

Widely spread over the tropical regions of the New and the Old World.

9. **P. tremula,** *R. Br. Prod.* 154.—Rhizome not seen. Fronds 1 to 5 (usually 2 to 4) ft. high, glabrous, twice to four times pinnate, not so broadly expanded and the divisions more regular than in *P. aquilina*, the pinnæ mostly opposite. Ultimate segments linear, rather firm when in fruit, ¼ to 1 in. long, slightly decurrent, membranous flat and serrulate when barren; veins mostly forked and transverse. Sori usually continuous but scarcely reaching the base of the segments and sometimes interrupted, at length expanded so as to conceal the indusium.—Hook. Spec. Filic. ii. 174, t. 120; Syn. Filic. 161; Hook. f. Fl. Tasm. ii. 140; Sieb. Syn. Filic. n. 130.

Queensland. York Peninsula, *N. Taylor;* Rockingham Bay, *Dallachy;* Mount Elliott, *Fitzalan;* Rockhampton and neighbouring districts, *Bowman, Thozet, O'Shanesy* and others.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, Woolls* and others; New England, *C. Stuart;* Hastings River, *Beckler;* Richmond River, *Mrs. Hodgkinson;* Tweed River, *Guilfoyle;* Lord Howe's Island, *Milne, M'Gillivray* and others.

Victoria. Wannon River, *Robertson;* Cape Otway Ranges and Gipps' Land, *F. Mueller.*

Tasmania. Common in shady places, forests, etc., *J. D. Hooker.*

Also in Norfolk and Fiji Islands and New Zealand, and closely allied to the European *P. arguta,* Ait. with which it is united by F. Mueller, Fragm. v. 126.

10. **P. aquilina,** *Linn. var.* esculenta; *Hook. Spec. Filic.* ii. 197, *Syn. Filic.* 163.—Rhizome thick and creeping. Fronds from 1 or 2 to 8 or 10 ft. high, usually thrice pinnate. Primary pinnæ distant, the lowest pair much larger and more compound, the upper gradually decreasing, giving the whole frond a triangular outline 2 to 4 ft. broad. Secondary or tertiary pinnæ numerous, lanceolate, deeply pinnatifid or pinnate, always ending in a linear undivided obtuse segment, the lateral segments oblong or linear, scarcely widened at the base but decurrent

on the rhachis, the midrib usually raised dilated and hardened with acute ciliate edges and the under surface usually hairy between the midrib and the sori. Sori continuous along the margin, the rather broa indusium really marginal, but the frond thickened and often minutel crenulate at the base of the indusium make it appear intramarginal.—Kunze in Pl. Preiss. ii. 111; Hook. f. Fl. Tasm. ii. 139; F. Muell. Fragm. v. 126; Sieb. Syn. Filic. n. 127; *P. esculenta*, Forst.; Labill Pl. Nov. Holl. ii. 95, t. 244; R. Br. Prod. 154.

Queensland. Rockingham and Edgcombe Bays, *Dallachy;* Daintree River *Fitzalan;* Rockhampton and neighbourhood, *Bowman. O'Shanesy, Thozet;* Brisbane *Henne.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, A. Cunningham* and others; New England, *C. Stuart;* Hastings River, *Beckler;* Richmond River *Mrs. Hodgkinson;* Illawarra, *Johnson;* Lord Howe's Island, *Fullagar.*

Victoria. Wendu Vale, *Robertson;* Melbourne, Dandenong Ranges, etc., *F. Mueller* and others; Grampians, *Sullivan.*

Tasmania. Derwent River, *R. Brown;* abundant throughout the island *J. D. Hooker.*

S. Australia. St. Vincent's Gulf, *F. Mueller;* Kangaroo Island, *Waterhouse.*

W. Australia. King George's Sound to Swan River, *Drummond, n.* 399, *Preiss, n.* 1300 and others.

The species is generally abundant in some form or other in most tropical and temperate regions of the globe, the var. *esculenta* only in the southern hemisphere. A few Australian specimens (Portland, *Robertson,* Flinders Bay, *Collie,* etc.) come very near to the typical form with small contiguous segments dilated at the base, pubescent underneath with a scarcely prominent midrib and with much less marginal thickening at the base of the indusium.

11. **P. incisa,** *Thunb.; Hook. Spec. Filic.* ii. 230, *Syn. Filic.* 172.—Rhizome creeping. Fronds varying from 1 to 5 ft. high, glabrous, twice or thrice pinnate. Pinnules of the barren fronds usually deeply pinnatifid, 1 to 2 in. long, with broad obtuse membranous lobes, the veins proceeding from the midrib of the pinnule repeatedly forked in each lobe, the branches here and there anastomosing or all free. In the fertile fronds the secondary pinnæ often pinnate at the base, pinnatifid in the upper part, the lower pinnules or segments with a distinct midrib and variously branched veins, the upper lobes less regularly veined. Sori continuous or interrupted, often neither reaching the base nor the apex of the segment.—Hook. f. Fl. Tasm. ii. 140; Sieb. Fl. Mixt. n. 252; F. Muell. Fragm. v. 124; *P. vespertilionis,* Labill. Pl. Nov. Holl. ii. 96, t. 245; R. Br. Prod. 154; *Litobrochia vespertilionis,* Presl; Bail. Queensl. Ferns, 26.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown, A. Cunningham* and others; Clarence River, *Beckler;* Richmond River, *Mrs. Hodgkinson;* Illawarra, *Johnson;* Lord Howe's Island, *C. Moore, Fullagar.*

Victoria. Mount Disappointment, Dandenong Ranges, *F. Mueller;* Grampians, *Sullivan;* Upper Yarra River, *Walter.*

Tasmania. Derwent River and King's Island, *R. Brown;* common in damp woods ascending to 3000 ft., *J. D. Hooker.*

S. Australia. Penola, *Woods.*

Spread over the tropical and southern extratropical regions of the New and the Old World.

12. **P. marginata**, *Bory; Hook. and Bak. Syn. Filic.* 172.—Rhizome not seen. Fronds on young plants sometimes under 1 ft., when full grown several feet high, the main rhachis branched, usually tripartite, each branch pinnate. Pinnæ numerous, 3 to 10 in. long, deeply pinnatifid; segments oblong or broadly linear, often falcate, obtuse, ¼ to 1 in. long, confluent into a winged rhachis 2 to 3 lines broad; veins copiously reticulate on each side of the midrib. Sori often continued round the sinus, but rarely reaching the ends of the lobes. Barren fronds thinner, the lobes often minutely dentate.—*P. tripartita*, Swartz; Hook. Spec. Filic. ii. 225, t. 138; F. Muell. Fragm. v. 125; *P. Milneana*, Baker, Syn. Filic. 170; *Litobrochia tripartita*, Presl, and *L. Milneana*, Bail. Queensl. Ferns, 26.

Queensland. Rockingham Bay, *Dallachy;* Bellenden Ker Range, *W. Hill;* Daintree River, *Fitzalan;* Bowen, *Woolls.*

Ranges over tropical Asia and Africa and the Pacific Islands.

P. Feliciennæ, F. Muell. Fragm. v. 124, from Rockingham Bay, is evidently a small frond of this species, probably from a young root. We have similar specimens from various stations.

13. **P. comans,** *Forst.; Hook. Spec. Filic.* ii. 219, *Syn. Filic.* 171.—Near *P. marginata*, but larger and more branched, the main rhachis bearing several branches or primary pinnæ of 1 to 2 ft. or more. Secondary pinnæ 4 to 10 in. long, deeply pinnatifid; segments numerous, ½ to 2 in. long, oblong-lanceolate or linear, often falcate, decurrent along the rhachis which is not however uniformly winged as in *P. marginata;* some of the lower segments sometimes again shortly pinnatifid; veins copiously reticulate. Sori usually continued round the sinus but rarely to the tips of the lobes. Barren segments or barren tips of the fertile ones usually dentate.—F. Muell. Fragm. v. 125; *P. Endlicheriana*, Agardh; Hook. Ic. Pl. t. 973, Spec. Filic. ii. 218; Hook. f. Fl. Tasm. ii. 141; *P. microptera* Metten.; Kuhn in Linnæa, xxxvi. 92.

Queensland. Toowamba, *Hartmann.*
N. S. Wales. Blue Mountains, *Woolls;* Lord Howe's Island, *C. Moore.*
Victoria. Johanna River, *F. Mueller;* Dandenong, *L. Morton;* Apollo Bay, *Wilkinson.*
Tasmania. Circular Head, *Gunn, Emmett, F. Mueller.*

Also in New Zealand and the Pacific Islands.

26. LOMARIA, Willd.

(Steganía, *R. Br.*)

Rhizome creeping or ascending into a short trunk. Fronds pinnatifid or simply pinnate, rarely undivided, the outer ones of each year's shoot barren with flat pinnules, the inner ones with linear fertile pinnules or rarely a few lower barren ones. Sori in a continuous line on each side of the midrib between it and the margin, with a membranous indusium attached close to the margin and opening on the inner side next the midrib, the sori at length covering almost the whole of the under surface. Veins of the barren pinnules transverse or oblique on the midrib, mostly forked.

The genus is generally distributed over the tropical and temperate regions of the globe. Of the ten Australian species three are common to the New and the Old World, three are limited to the Old World and chiefly Asiatic, one is only in New Zealand and the South Pacific Islands, three appear to be endemic.

Fronds simple or with few long segments decurrent on the stipes . . . . 1. *L. Patersoni.*
Barren fronds with numerous segments attached to the rhachis by a broad base, the upper ones confluent.
  Lowest segments as long as the others or nearly so . . . 2. *L. vulcanica.*
  Lower segments gradually smaller and more distant.
    Rhachis and stipes glabrous except at the very base.
      Barren segments narrow, 1 to 4 in. long, fertile ones nearly as long. Rhachis dark . . . . 3. *L. discolor.*
      Barren segments broadly lanceolate, 1 to 1½ in. long; fertile ones ½ to 1 in. Rhachis pale . . . . . . 4. *L. lanceolata.*
      Barren segments lanceolate acuminate 1 to 1½ in. fertile ones above 2 in. subulate. Rhizome with copious linear subulate scales . . . . 5. *L. attenuata.*
      Barren segments ovate-oblong, rarely ½ in. long, fertile ones 2 to 5 lines long . . . . 6. *L. alpina.*
    Rhachis and stipes scaly or hispid.
      Barren segments ½ to 1 in. long, 3 to 4 lines broad, the margins and veins glabrous . . . . 7. *L. fluviatilis.*
      Barren segments 1½ to 2 in. long, ½ in. broad, the margins and veins ciliate . . . . 8. *L. Fullageri.*
Barren fronds with several or numerous pinnæ attached by the midrib only, the lowest rarely small.
  Segments obliquely truncate at the base . . . . 9. *L. capensis.*
  Segments tapering at the base . . . . 10. *L. euphlebia.*

1. **L. Patersoni,** *Spreng.; Hook. Spec. Filic.* iii. 3, *Syn. Filic.* 174.—Rhizome short and thick. Fronds from under 1 ft. to near 2 ft. long, undivided or pinnatifid with few (very rarely 9 or 11) linear segments of 3 to 6 in., more or less decurrent on the rhachis and short stipes, those of the barren fronds ½ to 1 in. broad, the veins transverse; segments of the fertile fronds as long but only 1 to 2 lines broad, the sori at length covering the whole under surface. Occasionally the lower portion of the frond broad and barren and the upper segments wholly or partially narrow and fertile.—Hook. Filic. Exot. t. 49; Hook. f. Fl. Tasm. ii. 141; F. Muell. Fragm. v. 122; *Stegania Patersoni*, R. Br. Prod. 152; *Lomaria elongata*, Blume; Hook. Spec. Filic. iii. 3, t. 143.

Queensland. Rockingham Bay, *Dallachy;* Mount Lindsay, *W. Hill;* southern districts, *Hartmann.*

N. S. Wales. Port Jackson, *Woolls;* New England, *C. Stuart;* Macleay River, *Heriot;* Clarence River, *Wilcox;* Tweed River, *Guilfoyle;* Twofold Bay, *F. Mueller.*

Victoria. Sealer's Cove, Bunip and Hume Rivers, *F. Mueller;* Apollo Bay, *Walter.*

Tasmania. Port Dalrymple, *R. Brown;* N. E. of Launceston, *Gunn.*

Dispersed over East India, the Malayan Archipelago, the south Pacific Islands and New Zealand. From almost all the Australian localities there are specimens with undivided and with pinnatifid fronds, and sometimes the two from the same rhizome.

2. **L. vulcanica**, *Blume; Hook. Spec. Filic.* iii. 12, *Ic. Pl. t* 969, *Syn. Filic.* 176.—Rhizome thick or shortly creeping, covered with shining black hairlike scales. Fronds under 1 ft. high, glabrous, deeply pinnatifid with numerous segments; those of the barren fronds lanceolate, falcate, confluent by their broad base, the lower ones 1 to 2 in. long, 3 to 6 lines broad, the lowest pair scarcely smaller and sometimes reflexed, the upper segments gradually diminished to short lobes. Segments of the fertile fronds nearly as long, under 2 lines broad except the dilated adnate base.—Hook. f. Fl. Tasm. ii. 143.

Queensland? A specimen with barren fronds only from York Peninsula, *N. Taylor*, appears to be this plant.
Tasmania. Franklin River and other mountainous parts of the colony, *J. D. Hooker;* Mount Lapegrouse, *C. Stuart.*

Also in New Zealand, Java and the South Pacific Islands.

3. **L. discolor**, *Willd.; Hook. Spec. Filic.* iii. 5, *Syn. Filic.* 175.—Rhizome thick, ascending into a short trunk. Fronds 1 to 2 ft. or sometimes longer, pinnate or deeply pinnatifid, the rhachis and stipes glabrous and shining black, with scales only at the base of the stipes. Larger pinnules of the barren fronds 1½ to 3 or even 4 in. long, broadly linear or narrow-lanceolate, mostly connected by their dilated base, usually of a thicker texture and the veins less conspicuous than in *L. lanceolata*, the lower ones gradually smaller and more distinct. Pinnules of the fertile fronds very numerous, 1 to 4 in. long, 1½ to 2 lines broad. —Hook. f. Fl. Tasm. ii. 143; F. Muell. Fragm. v. 121; Sieb. Fl. Mixt. n. 245; *Stegania nuda* and *S. falcata*, R. Br. Prod. 153; *Onoclea nuda*, Labill. Pl. Nov. Holl. ii. 96, t. 246.

Queensland. Rockingham Bay, *Dallachy.*
N. S. Wales. Port Jackson to the Blue Mountains, *A. Cunningham, Woolls;* Hastings River, *C. Moore;* Illawarra, *A. Cunningham* and others; Twofold Bay, *F. Mueller.*
Victoria. From Dandenong to E. Gipps' Land, *F. Mueller* and others.
Tasmania. Port Dalrymple, *R. Brown;* abundant in damp forests, etc., *J. D. Hooker* and others.
S. Australia. Lofty Ranges, *F. Mueller.*

Also in New Zealand and Norfolk Island. Barren specimens occur sometimes with the larger pinnules pinnatifid above the middle.

4. **L. lanceolata**, *Spreng.; Hook. Spec. Filic.* iii. 11, *Ic. Pl. t.* 429, *Syn. Filic.* 177.—Rhizome thick, sometimes rising into a trunk of ½ ft. or more. Fronds 6 in. to above 1 ft. long, deeply pinnatifid or pinnate, the rhachis glabrous, usually pale coloured or green. Segments of the barren fronds oblong or lanceolate, dilated at the base, contiguous and often confluent, the longer ones ¾ to near 2 in. long and 4 to 6

lines broad, the lower gradually smaller, the lowest very short and broad. Segments of the fertile fronds under 1 in. long, about 1¼ lines broad.—Hook. f. Fl. Tasm. ii. 143; F. Muell. Fragm. v. 121; *Stegania lanceolata*, R. Br. Prod. 152.

Victoria. Hopkins River, ***Allan***, and thence to Wilson's Promontory sparingly in shaded woods, *F. Mueller*.

Tasmania. *R. Brown;* abundant in subalpine moist forests, *J. D. Hooker*.

S. Australia. Mount Gambier, *F. Mueller*.

Also in New Zealand and the Pacific Islands.

5. **L. attenuata,** *Willd.; Hook. Spec. Filic.* iii. 6, *Syn. Filic.* 176.—Rhizome thick, creeping up the stems of fern trees, densely covered with long almost hairlike brown scales. Fronds 1 to 1½ ft. long, deeply pinnatifid, almost pinnate from near the base. Segments of the barren ones lanceolate-falcate, 1 to 2 in. long in the centre of the frond, the lower ones gradually smaller, the lowest very short and broad, all attached by their broad base and mostly confluent, the rhachis glabrous or slightly scaly. Veins oblique from the midrib, once forked. Segments of the fertile fronds very narrow linear, 2 to 4 in. long.

N. S. Wales. Lord Howe's Island, on the stems of tree ferns, *C. Moore*, *Fullagar*, *Fitzgerald*.

Ranges over tropical America, southern Africa, the Mascarene and Pacific Islands.

6. **L. alpina,** *Spreng.; Hook. Spec. Filic.* iii. 16; *Filic. Exot. t.* 32, *Syn. Filic.* 178.—Rhizome creeping, scaly. Fronds deeply pinnatifid or pinnate, 3 to 8 in. long, the rhachis and slender stipes glabrous. Pinnules or segments of the barren fronds oblong, obtuse, attached by their broad base, the larger ones scarcely ½ in. long, ¼ in. broad and usually distinct, the upper ones smaller and confluent, the lower gradually smaller, short, broad, sometimes distant. Fertile fronds often much longer than the barren ones, the segments 2 to 5 lines long, 1 to 1½ lines broad. — Hook. f. Fl. Tasm. ii. 144; F. Muell. Fragm. v. 121; *Stegania alpina*, R. Br. Prod. 152.

N. S. Wales? Macleay River, *C. Moore*, two barren fronds appear to belong to this species.

Victoria. Upper Hume River, Mount Useful and other Alps, abundant, *F. Mueller*.

Tasmania. Table Mountain (Mount Wellington) *R. Brown;* abundant in boggy places and tops of all the mountains, *J. D. Hooker;* Southport, in plains near the sea, *C. Stuart*.

Also in extratropical South America and New Zealand.

7. **L. fluviatilis,** *Spreng.; Hook. Spec. Filic.* iii. 34, *Syn. Filic.* 181.—Rhizome short, thick, scaly. Fronds 6 in. to above 1 ft. long, pinnate. Pinnules or segments of the barren ones oblong, rounded at the end, attached by their broad base, the larger ones ½ to near 1 in. long, 3 to 4 lines broad, all distinct, the upper ones smaller and confluent, the lower gradually smaller and more distant, the rhachis more or less scaly. Segments of the fertile fronds 6 to 8 .ines long,

1 to 1½ lines broad.—Hook. f. Fl. Tasm. ii. 142, t. 167; F. Muell. Fragm. v. 121; *Stegania fluviatilis*, R. Br. Prod. 152.

Victoria. Deep shaded valleys, Delatite, Mitta-Mitta, Bawbaw, etc., in Gipps' Land, ascending to 5000 ft., *F. Mueller.*

Tasmania. Derwent River, *R. Brown*; covering shaded precipices near the Acheron River, *Gunn*; shady creeks, Southport, *C. Stuart*

Also in New Zealand.

8. **L. Fullageri,** *F. Muell. Fragm.* viii. 157.—Rhizome lengthening into a trunk of 1 to 2 ft. and with the remains of old fronds 2 to 4 in. thick. Fronds mostly about 1 ft. long, pinnate. Segments of the barren ones oblong-lanceolate, obtuse, obtusely auriculate at the base on each side, the larger ones 1½ to 2 in. long and ½ in. broad, the upper ones shorter and confluent, the lower smaller distant and more auriculate, all attached by their broad base, the margins and forked veinlets ciliate, the rhachis densely ferruginous-hispid. Segments of the fertile fronds 1 to 2 in. long, scarcely 1 line broad.—*L. auriculata*, Bak. Syn. Filic. 481.

N. S. Wales. Lord Howe's Island, *C. Moore*, *Fullagar*, *Fitzgerald*. Baker's name and diagnosis were printed off early in 1873, though not actually published till 1874, at about the same time as F. Mueller's.

9. **L. capensis,** *Willd.*; *F. Muell. Fragm.* v. 121.—Rhizome thick and scaly, short or ascending to a short trunk. Fronds pinnate, the segments of the barren ones broadly lanceolate, very oblique at the base and attached only by the midrib, the lowest pairs not much smaller or very rarely one small pair lower down, otherwise very variable, the frond sometimes 3 to 4 ft. long with numerous rigid pinnæ 3 to 6 in. long and 1 in. broad, and from that to a whole frond of 6 in. with membranous pinnæ of ½ to 1 in., the rhachis slightly scaly or glabrous. Fertile fronds equally variable, the narrow linear pinnæ in some specimens under 1 in. in others above 6 in. long.—*L. procera*, Spreng.; Hook. Spec. Filic. iii. 22, Syn. Filic. 179, Ic. Pl. t. 427, Gard. Ferns, t. 53; Hook. f. Fl. Tasm. ii. 142; *Blechnum procerum*, Labill. Pl. Nov. Holl. ii. 97, t. 247; *Stegania minor* and *S. procera*, R. Br. Prod. 153.

Queensland. Rockingham Bay, *Dallachy*; Mount Lindsay, *W. Hill*; Bowen, *Woolls.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *A. Cunningham*, *Woolls* and others; New England, *C. Stuart*; Clarence River, *Beckler*, *Wilcox*; Tweed River, *Guilfoyle*; Lord Howe's Island, *C. Moore.*

Victoria. From Melbourne and the Grampians to East Gipps' Land, *F. Mueller* and others.

Tasmania. Port Dalrymple and King's Island, *R. Brown*; abundant in wet shady places throughout the island, *J. D. Hooker.*

S. Australia. Mount Lofty Ranges, *F. Mueller.*

The species is dispersed over tropical and southern extratropical America, the Malayan Archipelago, the south Pacific Islands and New Zealand.

10. **L. euphlebia,** *Kunze; Hook. Spec. Filic.* iii. 20, *Syn. Filic.* 183.—Rhizome thick and woody, slightly scaly, ascending to 1 ft. or more. Fronds pinnate, often above 2 ft. long. Pinnæ distant, lanceolate, 3 to 8 in. long, ½ to ¾ in. broad, contracted at the base and sometimes tapering to a short petiole, the uppermost one rarely sessile or slightly decurrent, the lowest not much smaller, the rhachis glabrous. Pinnæ of the fertile fronds narrow linear, 3 to 6 in. long.—*L. articulata*, F. Muell. Fragm. v. 187.

Queensland. Rockingham Bay, *Dallachy*.

Spread over East India, China and Japan. Dallachy's specimens exactly correspond with the typical form figured by Kunze, Farrenkr. t. 125. Hooker's figure 2nd Cent. Ferns, t. 89, represents an abnormal Japanese and Chinese variety with the pinnæ from the middle upwards adnate by a broad base. I cannot perceive the obliquity of the ring of the spore-cases which has induced some pteridologists to place the species in a different genus.

27. BLECHNUM, Linn.

Rhizome short and thick or slightly elongated and horizontal. Fronds deeply pinnatifid or pinnate or in species not Australian simple or bipinnate, the segments narrow. Sori in a continuous line on each side of the midrib, with a membranous indusium opening from under the midrib outwards, the two sori often at length confluent concealing the midrib.

The genus consists of but few species dispersed over the tropical and sub-tropical regions of the globe. Of the four Australian species two have a wide range, one of them chiefly in America but also in Asia, the other only in the Old World, the remaining two species appear to be endemic.

Segments with a dilated adnate base, the upper ones confluent	1. *B. cartilagineum.*
Segments or pinnæ attached by the midrib only or rarely a few of the uppermost adnate.	
Segments obliquely truncate at the base. Barren fronds with much broader and shorter segments than the fertile. Veins not very close	2. *B. lævigatum.*
Segments smooth and shining with very numerous fine parallel veins.	
Segments serrulate, obliquely truncate at the base . .	3. *B. serrulatum.*
Segments with entire margins, mostly narrowed at the base	4. *B. orientale.*

1. **B. cartilagineum,** *Swartz; Hook. Spec. Filic.* iii. 43, *Syn. Filic.* 184.—Rhizome short thick and woody, usually covered with shining black scales. Fronds 1 to 2 ft. long, the stipes usually scabrous. Segments numerous, 3 to 6 in. long, almost coriaceous, serrulate, distinctly veined, dilated and adnate at the base, the upper smaller ones confluent, the lower ones sometimes distant.—Metten.

Filic. Hort. Lips. t. 5; R. Br. Prod. 152; F. Muell. Fragm. v. 120 Sieb. Syn. Filic. n. 123; *B. striatum*, Sond. and Muell. in Linnæa, xxv. 717, not of Swartz.

Queensland. Rockingham Bay, *Dallachy;* Port Denison and Daintree River, *Fitzalan;* Rockhampton, *O'Shanesy;* various localities in South Queensland, *Leichhardt*, *Hartmann* and others.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *A. Cunningham* and others; New England, *C. Stuart;* Hastings River, *Beckler;* Richmond River, *Henderson;* Tweed River, *Guilfoyle;* Illawarra, *Johnson;* Twofold Bay, *F. Mueller.*

Victoria. Dandenong Ranges, Sealer's Cove, Gipps' Land, etc., *F. Mueller* and others.

B. nitidum, Presl, at least as to the Australian plant referred to it in Bail. Queensl. Ferns, 15, appears to be only a slight variety of *B. cartilagineum*, with a smoother stipes and rhachis.

2. **B. lævigatum,** *Cav.; Hook. Spec. Filic.* iii. 55, *t.* 160, *Syn. Filic.* 186.—Rhizome thick and horizontal, very scaly. Fronds 1 to 2 ft. long. Pinnæ all distinct, obliquely truncate at the base, attached by the midrib only, in some fronds all barren, 1½ to 6 in. long, ½ to 1 in. broad, entire or serrulate; in other fronds all fertile, 2 to 5 in. long, 2 lines broad, the sori occupying almost the whole under surface; in other fronds again 4 to 6 in. long, 4 to 6 lines broad, with the sori next the midrib as in *B. cartilagineum*, but not adnate to the rhachis. R. Br. Prod. 152; F. Muell. Fragm. v. 120; *B. ambiguum*, Kaulf. in Sieb. Syn. Filic. n. 106.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Clowes*, *Woolls.*

3. **B. serrulatum,** *Rich.; Hook. Spec. Filic.* iii. 54, *Syn. Filic.* 186.—Rhizome short and thick or longer and creeping. Fronds 1 to 2 ft. long. Pinnæ distinct, linear or lanceolate, mostly 2 to 4 lines long and nearly 3 lines broad or 4 lines when barren, obliquely truncate at the base but attached by the midrib only, serrulate, smooth and shining, the veins oblique very numerous and fine, mostly forked. Sori close to the midrib, the indusium soon concealed under them.—*B. striatum*, R. Br. Prod. 152; Hook. Spec. Filic. iii. 55, t. 159; Sieb. Syn. Filic. n. 125, Fl. Mixt. n. 242; F. Muell. Fragm. v. 120.

N. Australia. Providence Hill and M'Adam Range, *F. Mueller;* Port Darwin, *Schultz, n.* 487; Port Essington, *Armstrong.*

Queensland. Cape York, *Daemel;* Rockingham Bay, *Dallachy;* Rockhampton, *Thozet;* Moreton Bay, *C. Stuart.*

N. S. Wales. Port Jackson, *R. Brown*, *A. Cunningham;* Richmond River, *Mrs. Hodgkinson.*

Dispersed over tropical America, the Malayan Archipelago and New Caledonia.

4. **B. orientale,** *Linn.; Hook. Spec. Filic.* iii. 52, *Syn. Filic.* 186,

Filic. Exot. t. 77.—Rhizome thick rising to a short erect trunk. Fronds 2 to 3 ft. long. Pinnæ distinct, 6 in. 1 ft. long, ½ to 1 in. broad near the base, tapering to a long point, mostly cuneate at the base and attached by the midrib only, the numerous veins very fine as in *B. serrulatum*, but the margins quite entire. Sori close to the midrib and soon covering it. A few of the uppermost pinnæ occasionally adnate and decurrent on the rhachis.—F. Muell. Fragm. v. 120; Bedd. Ferns S. Ind. t. 29.

N. Australia. Adelaide River, *M'Douall Stuart*.

Queensland. Rockingham Bay, *Dallachy*; Islands off the Coast, *Leefe*, *Walter*; Daintree River, *Fitzalan*; Gilbert River, *Daintree*.

Also in East tropical Asia and in the South Pacific Islands.

28. MONOGRAMME, Schkuhr.

Rhizome slender, creeping. Fronds simple, narrow, veinless except the midrib. Sori in a single continuous line in the upper part of the frond, in a groove opening along the midrib, the margins of the groove forming an indusium along one or both sides of the sorus.

A small genus spread over the tropical and southern extratropical regions of the New and the Old World. The only Australian species extends over the area of the genus at least in the Old World.

1. **M. Junghuhnii**, *Hook. Spec. Filic.* v. 123, *Syn. Filic.* 375, var. *tenella*.—Rhizome almost filiform, intricately matted, covered with fine hairlike scales. Fronds slender and grass-like, 1 to 2½ in. high, entire, scarcely ¼ line broad, flat with a prominent midrib in the lower barren part, the upper fertile half rather broader.—Bedd. Ferns S. Ind. t. 210; F. Muell. Fragm. vii. 110; *Diclidopteris angustissima*, Brackenr. Filic. U. S. Expl. Exped. 135, t. 17.

Queensland. Rockingham Bay, *Dallachy*. The numerous specimens in the collection are all quite similar to Ceylonese ones, as figured by Beddome. The typical form from the Malayan Archipelago and Pacific Islands, more specially described by Hooker, has very much longer and stouter fronds.

29. DOODIA, R. Br.

Rhizome tufted. Fronds simply pinnate or deeply pinnatifid. Sori oblong or shortly linear, on transverse veinlets connecting the forked veins proceeding from the midrib, in one or two rows parallel to the midrib on each side, with an indusium of the same shape, proceeding from the veinlet and opening on the inner side. Scabrous ferns, often small.

Besides the Australian species of which two are endemic and the third extends to New Zealand and the Pacific Islands, there is a fourth from Ceylon.

Pinnules or segments all adnate by their broad base.
  Fronds rarely exceeding 1 ft., very scabrous. Sori ovate, in 1 or 2 rows between the midrib and the margin . . . . 1. *D. aspera.*
  Fronds mostly above 1 ft. long. Sori narrow-oblong in a row very near the midrib . . . . 2. *D. blechnoides.*
Lower or nearly all the pinnules attached only by the midrib, or the lowest petiolate. Sori oblong . . . 3. *D. caudata.*

1. **D. aspera,** *R. Br. Prod.* 151.—Fronds erect, rigid, mostly about 1 ft. or less but varying from 6 to nearly 18 in., the pinnules as well as the rhachis exceedingly scabrous. Pinnules or segments numerous, all attached by their broad or dilated base, rigidly serrulate, those in the centre of the frond lanceolate falcate, 1 to 2 rarely nearly 3 in. long, the upper ones shorter and more confluent gradually reduced to the lanceolate point of the frond, the lower segments more distinct, gradually shorter, the lowest reduced to small wing-like appendages to the rhachis. Sori ovate or almost rounded, usually in one row on each side at a little distance from the midrib, but in the larger segments often numerous in at least two rows on each side.—Hook. Spec. Filic. iii. 71, Syn. Filic. 189, Exot. Fl. t. 8; Sieb. Fl. Mixt. n. 249; F. Muell. Fragm. v. 130; *Woodwardia aspera*, Metten.; Bail. Queensl. Ferns, 27.

Queensland. Brisbane and Burnett Rivers, *F. Mueller;* Mount Elliott, *Fitzalan.*

N. S. Wales. Hunter's River, *R. Brown;* Port Jackson to the Blue Mountains, *A. Cunningham, Fraser, Gaudichaud;* New England, *C. Stuart;* Richmond River, *C. Moore* and others; Hastings, Macleay and Clarence Rivers, *Beckler;* Tweed River, *Guilfoyle;* Illawara, *Johnson;* Twofold Bay, *F. Mueller;* Lord Howe's Island, *C. Moore.*

Victoria. Broadribb and Snowy Rivers, *F. Mueller;* Cape Howe, *Walter.*

2. **D. blechnoides,** *A. Cunn.; Hook. Spec. Filic.* iii. 72, *Syn. Filic.* 189.—A larger plant than *D. aspera,* and much less scabrous. Pinnæ similarly dilated and adnate at the base, but thinner with finer more numerous nerves connected in areoles near the midrib, parallel and simple between the sori and the margin. Sori transversely narrow-oblong, forming a regular row on each side of the midrib and very near it, with very rarely a few small ones outside the row. The whole frond 1 to 1½ ft. long, the larger pinnæ 3 to 4 in., a few at the base of the frond smaller and distant, but none of the short broad ones of *D. aspera.*—Metten. Filic. Hort. Lips. t. 6, f. 3.

N. S. Wales. Nepean River, *Fraser, A. Cunningham;* Cedar Creek, New England, *C. Stuart.*

3. **D. caudata,** *R. Br. Prod.* 151.—A smaller more slender plant

than *D. aspera*, the fronds often decumbent at the base, ascending in the typical form to 6 to 8 in., or rarely to 1 ft., scabrous but not so much so as in *D. aspera* and very variable. Lower pinnæ distinct, short, ovate or ovate-lanceolate, often broadly biauriculate, attached by the midrib only and mostly barren; intermediate ones lanceolate falcate with a broad base, mostly fertile and attached by the midrib only, the upper ones more adnate, the uppermost short and confluent into a lanceolate or linear apex to the frond, but sometimes the whole frond consisting of short broad barren pinnæ, or the narrow fertile ones continued nearly to the base, and in a few specimens the narrow almost entire apex occupying nearly the whole frond. Sori oblong, usually in a single row on each side of the midrib, and sometimes almost confluent.—Hook. Spec. Filic. iii. 75, Syn. Filic. 190, Exot. Fl. t. 25; Hook. f. Fl. Tasm. ii. 147; F. Muell. Fragm. v. 129; *D. rupestris*, Kaulf. in Sieb. Syn. Filic. n. 114, Fl. Mixt. n. 248; *Woodwardia caudata*, Cav.; Bail. Queensl. Ferns, 27.

Queensland. York Peninsula, *N. Taylor;* Rockingham Bay, *Dallachy;* Daintree River, *Fitzalan;* Rockhampton, Moreton Bay and other localities in S. Queensland. *Bowman*, *Dallachy*, *F. Mueller* and others.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *A. Cunningham* and others; New England, *C. Stuart;* Hastings River, *Beckler;* Clarence River, *Wilcox;* Tweed River, *Guilfoyle.*

Victoria. Wannon River, *Robertson;* Dandenong Ranges and Gipps' Land, *F. Mueller.*

Tasmania. Port Dalrymple, *R. Brown;* abundant in dry stony situations as well as in shady places, *J. D. Hooker.*

Also in New Zealand and the South Pacific Islands.

Var. *media.* Fronds larger, often above 1 ft. long. Longer segments in the middle of the frond 1 to 2 in. long. I can find no other difference, and the intermediate sizes are numerous.—*D. media*, R. Br. Prod. 151; Hook. Spec. Filic. iii. 74, Syn. Filic. 190; *Woodwardia media*, Fée; Bail. Queensl. Ferns, 27.—Endeavour River, *Banks and Solander;* sent from most of the same stations as the typical form, but more frequent in Queensland and the northern parts of N. S. Wales, whilst in Victoria and Tasmania the small form is the most common.

30. ASPLENIUM, Linn.

Rhizome creeping, or short and thick, or rising to a shortly arborescent trunk. Sori linear or rarely oblong, on veins proceeding from the midrib or the base of the pinnules or on their branches. Indusium linear or oblong, attached along one side to the vein and opening along the other side.

A large genus generally dispersed over the tropical and temperate regions of the globe. Of the 21 Australian species, 3 have a more or less general distribution over the New as well as the Old World, 9 are limited to the Old World, 4 extend to New Zealand, one of them also in the extreme south of America, the remaining 5 are endemic.

SECT. I. **Euasplenium.**—*Sori linear, diverging from the midrib or from the petiole towards the margin the indusium opening from the inner or upper edge outwards.*

Fronds entire. Veins and sori parallel and transverse.
Fronds coriaceous, 1 to 6 ft. long, 3 to 8 in. broad. Veins closely parallel, connected within the margin . . . . 1. *A. nidus.*
Fronds thinner, 1 to 1½ ft. long, ¾ to 1¼ in. broad. Veins mostly 1 line apart, not connected at the end . . . . 2. *A. simplicifrons.*
Fronds linear-lanceolate, broken into segments only at the base. Veins very oblique, parallel . . . . . 3. *A. attenuatum*
Fronds simply pinnate.
Veins few, forked, pinnately diverging from an irregular midrib. Fronds small, tufted, pinnules 2 to 3 lines long . . . . 4. *A. trichomanes.*
Veins more or less tripartite or flabellate at the base of the pinnule, one branch usually elongated and penninerved.
Fronds weak, diffuse. Pinnules obliquely obovate or fan-shaped, 3 to 6 lines broad . . . . . . 5. *A. flabellifolium.*
Fronds diffuse, scaly-hirsute. Pinnules ovate fan-shaped or broadly lanceolate, 6 to 9 lines long . . . . 6. *A. paleaceum.*
Fronds attaining 1 to 2 ft. Pinnules lanceolate, acuminate, 1½ to 5 in. long . . . . 7. *A. falcatum.*
Veins numerous and parallel from the midrib. Pinnules oblong or lanceolate, coriaceous . . . . . 8. *A. obtusatum.*
Fronds bipinnate. Segments cuneate, striate.
Fronds 3 to 6 in. long. Primary pinnæ ½ to 1 in. long, with small distinct segments. Sori few, rather large . . . . 9. *A. Hookerianum.*
Fronds 6 to 18 in. long. Primary pinnæ lanceolate, 1½ to 2 in. long, with distinct or confluent toothed segments . . . . 10. *A. furcatum.*
Fronds 2 to 3 ft. long, thrice or four times pinnate, with numerous primary and secondary pinnæ. Sori small . . . . 11. *A. laserpitiifolium.*

SECT. II. **Darea.**—*Sori oblong or linear on a vein parallel to the margin of the teeth or lobes and opening towards the margin.*

Sori large with prominent indusia, one to each tooth or lobe of the pinnules.
Fronds 1 to 2 ft. long, mostly bipinnate; pinnules lanceolate, ½ to 1 in. long . . . . 12. *A. bulbiferum.*
Fronds mostly pinnate; pinnules very narrow, 3 to 6 in. long . . . . 13. *A. flaccidum.*
Sori narrow-linear with narrow thin indusia, variously arranged along the margins of the lobes. Fronds 4 to 8 in. long, 3 to 5 in. broad, with pinnatifid or pinnate pinnæ . . . . 14. *A. pteridioides.*

SECT. III. **Athyrium.**—*Sori small, often curved, mostly at the fork of the veinlets proceeding from the midrib.*

Fronds large, membranous, twice or thrice pinnate . . 15. *A. umbrosum.*

Sect. IV. **Diplasium.**—*Sori linear along veins pinnately diverging from a central vein to each lobe of the pinnule. Indusium narrow, opening, in the same frond, on the one or the other or both sides of the nerve.*

Fronds pinnate with pinnatifid pinnæ.
Rhizome creeping. Pinnæ deeply pinnatifid the lower lobes often divided to the midrib . . . . . . 16. *A. japonicum.*
Rhizome short thick. Pinnæ pinnatifid with short broad lobes . . . . 17. *A. sylvaticum.*
Fronds large, bipinnate. Trunk erect or shortly arborescent.
Lobes of the secondary pinnæ mostly broad and short. Sori and indusia narrow-linear . . . . 18. *A. maximum.*
Lobes of the secondary pinnæ mostly triangular or lanceolate. Sori and indusia short and oblong . . . . 19. *A. polypodioides.*
Lobes of the secondary pinnæ oblong or lanceolate. Sori and indusia dark-coloured mostly reaching the margin . . . . 20. *A. melanochlamys.*

Sect. V. **Anisogonum.**—*Sori and indusia of Diplasium but the lateral veinlets of each set frequently anastomosing with those of the adjoining set.*

Fronds large, pinnate, the pinnæ 6 to 12 in. long, 1 to 1½ in. broad . . . . 21. *A. decussatum.*

Sect. I. Euasplenium.—Sori linear, diverging from the midrib or from the petiole towards the margin, the indusium opening from the upper or inner edge outwards.

1. **A. nidus**, *Linn.*; *Hook. Spec. Filic.* iii. 77, *Syn. Filic.* 190.—Rhizome short and thick. Fronds simple, entire, lanceolate, sessile or nearly so in large regular tufts hollowed in the centre, the larger ones 2 to 6 ft. long and 3 to 8 in. broad. Veins numerous, nearly transverse, parallel, simple or forked, connected at the end in an intramarginal line. Sori along the upper or inner side of nearly all the veins, mostly reaching from the midrib to ½ or nearly ¾ of their length.—Bot. Mag. t. 3101; R. Br. Prod. 150; F. Muell. Fragm. v. 130; *A. australasicum*, Hook. Filic. Exot. t. 88; *Thamnopteris nidus*, Presl; Bedd. Ferns Brit. Ind. t. 197.

Queensland. Broad Sound, *R. Brown;* York Peninsula, *N. Taylor;* Rockingham Bay, *Dallachy;* Daintree River, *Fitzalan;* Moreton Bay, *F. Mueller;* Rockhampton and neighbouring districts, *Bowman*, *Thozet* and others.

N. S. Wales. Port Jackson, *Woolls;* Hastings River, *Beckler;* Clarence River, *Wilcox;* Richmond River, *Mrs. Hodgkinson;* Illawarra, *Johnson;* Twofold Bay, *F. Mueller;* Lord Howe's Island, *C. Moore*, *Fullagar.*

Widely spread over tropical Asia, extending to the Mascarene Islands on the one hand and to the Pacific Islands on the other.

2. **A. simplicifrons**, *F. Muell. Fragm.* v. 74.—Rhizome scaly. Fronds entire, membranous, 1 to 1½ ft long, ¾ to 1¼ in. broad, tapering to a point and decurrent on the short stipes. Veins transverse, simple

or forked, mostly about 1 line apart, not connected within the margin. Sori linear, not reaching either the margin or the midrib.—Hook. and Bak. Syn. Fil. 193.

Queensland. Bellenden Ker Range, *W. Hill;* rocky stony places, Rockingham Bay, *Dallachy ;* York Peninsula, *N. Taylor.*

3. **A. attenuatum,** *R. Br. Prod.* 150.—Rhizome tufted. Fronds linear-lanceolate, 6 in. to 1 ft. long, ½ to ¾ in. broad, entire the greater part of their length and tapering into a long point, often proliferous at the end, usually broken up in the lower part into a few obovate or oblong laterally adnate segments, the midrib scaly hairy underneath as well as the stipes. Veins very oblique, simple or forked. Sori variable in length, often reaching the midrib, rarely the margin.—Hook. Spec. Filic. iii. 92, Syn. Filic. 194, Ic. Pl. t. 914; Hook. and Grev. Ic. Filic. t. 220; F. Muell. Fragm. v. 130.

Queensland. Shaded woods, Moreton Bay, *A. Cunningham, F. Mueller* and others; Head of the Dee River, *Bowman.*
N. S. Wales. Grose River, *R. Brown ;* Blue Mountains, *Woolls ;* Macleay and Bellinger Rivers, *C. Moore ;* Richmond River, *Dargan.*

Var. *multilobum*, F. Muell. The greater part of the frond broken up into segments, but ending in the long entire point of *A. attenuatum.—A. paleaceum* var. *Prenticei*, Bak. Syn. Fil. 208.—Logan District, *Prentice ;* Richmond River, *C. Moore.*

4. **A. Trichomanes,** *Linn. ; Hook. Spec. Filic.* iii. 136, *Syn. Filic.* 196, *Brit. Ferns, t.* 29.—A small neat tufted fern. Fronds 2 to 6 in. high, simply pinnate, the rhachis slender, usually black. Pinnæ numerous, obovate orbicular or broadly oblong, nearly equal in size, those of the middle of the frond rather the largest, 2, 3 or rarely 4 lines long, more or less toothed. Veins forked, radiating from the midrib. Sori several on each pinna, oblong-linear and distinct when young, uniting in a circular mass when old.—Hook. f. Fl. Tasm. ii. 145; F. Muell. Fragm. v. 131.

N. S. Wales. Port Jackson to the Blue Mountains, *A. Cunningham, Woolls.*
Victoria. Grampians, *Robertson ;* Mount Aberdeen, Buffalo Ranges, Upper Snowy River, Gipps' Land, *F. Mueller, Walter.*
Tasmania. Clifts of rocks by the Acheron and Franklin Rivers, *Gunn.*

Dispersed over the temperate regions of the Northern and Southern hemispheres in the New and the Old World, and in some mountainous districts within the tropics.

5. **A. flabellifolium,** *Cav.; Hook. Spec. Filic.* iii. 146, *Syn. Filic.* 195, *Exot. Fl. t.* 208.—Rhizome tufted. Fronds weak, straggling or prostrate, slender, from a few in. to 1 ft. long, simply pinnate. Pinnæ shortly petiolate, obliquely obovate orbicular or fan-shaped, toothed and the larger ones sometimes 3-lobed, 2 to 3 lines broad in the smaller specimens, ⅓ in. in the larger ones. Veins few, forked, pin-

pinnately diverging from a short midrib often divided at the base into three nearly equal branches. Sori several on each pinna, linear when young, often confluent when old.—R. Br. Prod. 150; Sieb. Fl. Mixt. n. 236; Hook. f. Fl. Tasm. ii. 145; F. Muell. Fragm. v. 131.

Queensland. Dalrymple Creek, *Hartmann.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *A. Cunningham* and others; New England, *C. Stuart;* Clarence and Hastings Rivers, *Beckler*, *Wilcox;* Illawarra, *A. Cunningham*, *Johnson.*

Victoria. Numerous localities from Melbourne and the Grampians to Gipps' Land, *Robertson*, *F. Mueller* and others.

Tasmania. Port Dalrymple *R. Brown;* abundant in most parts of the island, especially in rocky or stony situations, *J. D. Hooker.*

W. Australia. Lucky Bay, *R. Brown;* King George's Sound and neighbouring districts, *Oldfield* and several others.

Also in New Zealand.

6. **A. paleaceum,** *R. Br. Prod.* 150.—Rhizome tufted. Fronds decumbent, 6 in. to 1 ft. long, simply pinnate, sometimes proliferous at the end, the stipes rhachis and often the principal veins scaly-hirsute. Pinnæ shortly petiolate, ovate ovate-lanceolate or fan-shaped, mostly ½ to ¾ in. long, irregularly denticulate and sometimes obscurely 3-lobed, prominently striate with the radiating forked veins more or less joining in a midrib. Sori linear, often long but not reaching the midrib.—Hook. Spec. Filic. iii. 162, t. 199, Syn. Filic. 208; F. Muell. Fragm. v. 131.

Queensland. Broad Sound, *R. Brown;* Frankland Islands, *M'Gillivray;* York Peninsula, *N. Taylor;*, Rockingham Bay, *Dallachy;* Rockhampton, *Bowman*, *O'Shanesy*, *Thozet.*

7. **A. falcatum,** *Lam.; Hook. Spec. Filic.* iii. 160, *Syn. Filic.* 208.—Rhizome tufted. Fronds from under 1 ft. to 2 ft. high including the rather long stipes, glabrous or sparingly scaly-hirsute, simply pinnate. Pinnæ shortly petiolate, oblique, lanceolate, acuminate, serrulate, and usually more or less distinctly pinnatifid with short broad dentate lobes and sometimes auriculate at the base, 1½ to 4 in. long, coriaceous, prominently striate, the veins very oblique diverging from the base and from the midrib. Sori linear, long and nearly reaching the margin or a few quite short.—R. Br. Prod. 150; F. Muell. Fragm. v. 131; *A. caudatum*, Forst.; Hook. Spec. Filic. iii. 152, Syn. Filic. 209, at least as to the Australian specimens.

Queensland. Brisbane River, Moreton Bay, *A. Cunningham*, *F. Mueller;* Rockhampton, *O'Shanesy;* Rockingham Bay, *Dallachy*, with very long points to the pinnæ.

N. S. Wales. Newcastle, *R. Brown;* New England, *C. Stuart;* Armidale, *Perrott;* Macleay and Hastings Rivers, *Beckler;* Richmond River, *Mrs. Hodgkinson;* Illawarra, *Shepherd;* Lord Howe's Island, *C. Moore*, *Fullagar.*

Widely spread over tropical Africa, Asia, the Pacific Islands and New Zealand. Beddome, Ferns S. Ind. t. 141 and 143, figures *A. falcatum* and *A. caudatum* from specimens much more paleaceous than any Australian ones, but all appear to represent one species.

8. **A. obtusatum,** *Forst.; Hook. Spec. Filic.* iii. 96, *Syn. Filic.* 207, *Filic. Exot. t.* 46.—Rhizome thick, scaly. Fronds 6 in. to about 1 ft. high, the rhachis and stipes usually rather thick, glabrous or sparingly scaly. Pinnæ coriaceous, shortly petiolate, in the typical form obliquely oblong or ovate-lanceolate, obtuse, ¾ to 1½ in. long, regularly crenate-toothed, and from that in some varieties to lanceolate, 3 to 5 in. long, toothed or pinnatifid. Veins from the midrib oblique and forked. Sori oblong-linear, not reaching the margin. usually several on each side of the midrib oblique equal and parallel.—Labill. Pl. Nov. Holl. ii. 93, t. 242; R. Br. Prod. 150; Hook. f. Fl. Tasm. ii. 145; *A. obliquum*, Forst.; Labill. l. c. 93, t. 242; *A. lucidum*, Forst.; Hook. f. Fl. Tasm. ii. 146.

Tasmania. Port Dalrymple, *R. Brown*; very abundant, especially on maritime rocks, *J. D. Hooker.*

Var. *difforme.* Pinnæ very obtuse, more or less pinnatifid.—*A. difforme*, R. Br. Prod. 151; Sieb. Syn. Filic. n. 119, Fl. Mixt. n. 267.

N. S. Wales. Port Jackson, close to the sea, *Woolls*; Port Macquarrie, *C. Moore*; Clarence River, *Woolls.*

Var. *lucidum.* Pinnæ obtuse, lanceolate, 2 to 5 in. long, obtusely serrulate, with very numerous parallel sori.—Lord Howe's Island, *C. Moore, Fullagar*

Var. *incisum.* Pinnæ lanceolate, 3 to 5 in. long, deeply pinnatifid, with a sorus on each segment.—Lord Howe's Island, *Fullagar.*

The species is also in New Zealand and in extratropical South America. It is reduced by F. Mueller, Fragm. v. 132, to the European *A. marinum*, a union which pteridologists are not generally disposed to sanction.

9. **A. Hookerianum,** *Colens.; Hook. Spec. Filic.* iii. 194, *Syn. Filic.* 213.—A small tufted fern. Fronds rarely above 6 in. long, slender but rather rigid, mostly bipinnate, the rhachis slightly scaly-hairy. Primary pinnæ in the lower part of the frond ½ to 1 in. long, with 6 to 10 distinct oblong-cuneate dentate segments 1 to 2 or rarely 3 lines long, the lower ones tapering to a petiole, the upper ones as well as the upper pinnæ small and confluent. Veins diverging, free. Sori few, usually only 1 or 2 on each segment, large in proportion.—*A. adiantoides*, Raoul; Hook. Ic. Pl. t. 983, not of Raddi.

N. S. Wales. Picton River, *Johnson*, a single specimen apparently referrible to this species but uncertain.

Victoria. Upper Hume River at an elevation of 4000 ft. and Colac Ranges *F. Mueller.*

Also in New Zealand.

10. **A. furcatum,** *Thunb.; Hook. Spec. Filic.* iii. 165, *Syn. Filic.* 214.—Rhizome thick, dark brown, scaly-hairy. Fronds 6 to 18 in. high, pinnate or bipinnate, slightly scaly-hairy. Pinnæ lanceo-

late, mostly 1½ to 2 in. long, deeply pinnatifid or pinnate; segments varying from oblong-cuneate toothed and confluent to linear-cuneate distinct and deeply 2- to 4-lobed, the segments or lobes all coriaceous, denticulate at the end, striate with few diverging veins. Sori few, large.—Bedd. Ferns S. India, t. 144; F. Muell. Fragm. v. 131; *A. præmorsum*, Swartz; R. Br. Prod. 150.

N. S. Wales. Grose River, *R. Brown*, *Mrs. Calvert*.
Victoria. Darlot's Creek, Grampians, *Allitt*.
W. Australia. King George's Sound and neighbouring districts, *Drummond*, *n.* 349, *Preiss n.* 1301, *Maxwell*, *F. Mueller*.

Widely spread over tropical America, tropical and southern Africa and the Pacific Islands. The western specimens have the segments of the pinnules narrow and distinct, in those from N. S. Wales they are broader and more confluent, but all appear to belong to the African and American species.

11. **A. laserpitiifolium,** *Lam.*; *Hook. Spec. Filic.* iii. 171, *t.* 203, *Syn. Filic.* 215.—Rhizome thick, generally creeping up the trunks of tree-ferns and other trees. Fronds 1½ to 3 ft. long, glabrous, 3 or 4 times pinnate. Larger primary pinnæ 6 to 8 in. long, with numerous secondary pinnæ of 1 to 2 in., again pinnate or the upper ones shorter and pinnatifid only, the primary as well as the secondary pinnæ tapering to a pinnatifid point. Ultimate pinnules or segments obovate or oblong-cuneate, toothed, prominently striate with diverging veins, mostly 3 or 4 lines long. Sori several on each segment, linear, usually rather small.—Bedd. Ferns S. Ind. t. 225.

Queensland. Endeavour River, *A. Cunningham*; Rockingham Bay, *W. Hill*, *Dallachy*; Daintree River, *Fitzalan*; Fitzroy Island, *M'Gillivray*, *Walter*.

Also in East tropical Asia, the Malayan Archipelago and South Pacific Islands, and very near to the widely spread tropical *A. cuneatum*, Lam., to which F. Mueller, Fragm. v. 131, reduces it and from which it differs chiefly in its much more compound fronds.

SECT. II. DAREA. Sori oblong or linear, on a vein proceeding from the midrib of the pinnæ as in *Euasplenium* but on a branch parallel to the margin of its teeth or lobes with the indusium opening towards the margin so as to appear marginal.

12. **A. bulbiferum,** *Forst.*; *Hook. Spec. Filic.* iii. 196, *Ic. Pl. t.* 423, *Syn. Filic.* 218.—Rhizome thick. Fronds 1 to 2 ft. long, glabrous or with a scaly rhachis, pinnate or more frequently bipinnate, often proliferous. Primary pinnæ numerous, usually 3 to 4 in. long. Pinnules lanceolate, mostly ½ to 1 in. long, pinnately toothed lobed or divided, with a single veinlet to each lobe or tooth; the whole frond as well as each pinna ending in a lanceolate toothed or lobed point. Sori large, one to each lobe or tooth, affixed to the central vein but the rather rigid prominent indusium thrown over towards the upper margin so as to make the sorus appear marginal.—Hook. f. Fl. Tasm. ii. 146;

Cœnopteris appendiculata, Labill. Pl. Nov. Holl. ii. 94, t. 243; *Asplenium laxum*, R. Br. Prod. 151.

N. S. Wales. Blue Mountains, *A. Cunningham*, *Mrs. Calvert*; Macleay and Bellinger Rivers, *C. Moore*; Clarence River, *Wilcox*.
Victoria. Mouth of the Glenelg, *Allitt*; Dandenong Ranges, Sealer's Cove, Apollo Bay, *F. Mueller*.
Tasmania. Derwent River, *R. Brown*; abundant in damp woods throughout the island, *J. D. Hooker*.
S. Australia. Mount Gambier, *F. Mueller*; Penola, *Woods*.

Scattered over various tropical and southern extratropical regions of the New and the Old World. Reduced by F. Mueller, Fragm. v. 132 with the following species to varieties of *A. marinum*, from which they appear to me to differ essentially in the position of the sori as well as in the forms assumed by the frond.

13. **A. flaccidum,** *Forst.*; *Hook. Spec. Filic.* iii. 205, *Syn. Filic.* 222.—Rhizome short and thick. Fronds from under 1 ft. to near 2 ft. or in specimens not Australian still longer, pale green, glabrous, pinnate. Pinnæ coriaceous, narrow, 3 to 6 in. long, the barren ones toothed, the fertile pinnately divided into linear lobes of 2 to 6 lines, each bearing a single rather large sorus attached to the central vein, but the conspicuous indusium thrown over to the upper side so as to appear marginal.—Hook. f. Fl. Tasm. ii. 146; *A. odontites*, R. Br. Prod. 151.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *A. Cunningham*, *Woolls*; New England, *C. Stuart*; Hastings River, *Fraser*; Clarence River, *Beckler*, *Wilcox*; Bellinger River, *C. Moore*; Illawarra, *Shepherd*.
Victoria. Mount Disappointment and Sealer's Cove, *F. Mueller*
Tasmania. Not uncommon on exposed rocks, etc., *J. D. Hooker*.

Also in New Zealand.

14. **A. pteridioides,** *Baker*, *Syn. Filic.* 488.—Rhizome thick and short. Fronds broadly ovate-lanceolate in outline, 4 to 8 in. long, 3 to 5 in. broad, glabrous, coriaceous, pinnate. Pinnæ broadly lanceolate, again pinnate or deeply pinnatifid; segments from obovate to linear-cuneate, ¼ to 1 in. long, with few obtuse teeth or short lobes; veins few, branching into the lobes. Sori linear, bordering the lobes on a branch of the vein parallel to and very near the margin; indusium narrow, proceeding from the nerve and opening outwards towards the margin.

N. S. Wales. Lord Howe's Island, *C. Moore. Fullagar*.

SECT. III. ATHYRIUM.—Sori small, often curved, mostly at the fork of veins proceeding from the midrib.

15. **A. umbrosum,** *J. Sm.*; *Hook. Spec. Filic.* iii. 231, *Syn. Filic.* 229.—Fronds 3 to 5 ft. long, 1 to 1½ ft. broad, twice or thrice pinnate. Pinnules membranous, lanceolate or oblong, 1 to 2 in. long, deeply

pinnatifid or smaller and pinnately toothed; veins oblique, usually forked, proceeding from the midrib into the lobes or teeth, free. Sori small, oblong, usually on the vein below the fork or partly on one fork and then slightly curved. Indusium membranous, proceeding from the vein, and opening on the upper or inner margin, the sori often at length covering the centre of the pinnule.—F. Muell. Fragm. v. 132.; *Allantodia australis* and *A. tenera*, R. Br. Prod. 149; *Asplenium Brownii*, J. Sm.; Hook. Ic. Pl. t. 978; Hook. f. Fl. Tasm. ii. 147; *A. australe*, Brackenr.; Hook. Spec. Filic. iii. 232; *A. physosorus*, Sieb. Fl. Mixt. n. 268.

Queensland. Moreton Bay, *F. Mueller;* Towomba, *Hartmann.*

N. S. Wales. Paterson River, *R. Brown;* Blue Mountains, *A. Cunningham, Woolls;* New England, *C. Stuart;* Macleay River, *Beckler;* Cape Byron and Tweed River, *C. Moore, Guilfoyle;* Illawarra, *Johnson.*

Victoria. Dandenong Ranges, *Boyle;* Broadribb and Snowy Rivers, *F. Mueller;* Cape Howe, *Walter.*

Tasmania, *Nelson;* not rare in dense shaded forests, *J. D. Hooker.*

Ranges over tropical Africa and Asia and is also in Norfolk Island and New Zealand.

SECT. IV. DIPLASIUM.—Sori linear along veins pinnately diverging from the central vein to each lobe of the pinnule. Indusium narrow, opening, in the same frond, sometimes on one side sometimes on the other or on both sides of the nerve.

16. **A. japonicum,** *Thunb.; Hook. and Bak. Syn. Filic.* 234.—Rhizome slender, creeping. Fronds pinnate, 1 to 1½ ft. long. Larger pinnæ 3 to 4 in. long, deeply pinnatifid, the lower segments reaching the shortly scaly-hirsute rhachis. Sori usually rather shorter than in *A. sylvaticum.*

N. S. Wales. Illawarra, a single specimen in Herb. F. Mueller, without the collector's name, so possibly some mistake. The species is east Asiatic, extending to South China and Japan.

17. **A. sylvaticum,** *Presl; Hook. Spec. Filic.* iii. 248, *Syn. Filic.* 232.—Rhizome short thick and scaly. Fronds pinnate, from 1 to above 2 ft. long. Pinnæ membranous, mostly attached by the midrib only or shortly petiolate, the larger ones 6 in. long, ¾ to 1 in. broad, regularly pinnatifid with short rounded denticulate lobes, with a central vein to each lobe and several oblique parallel veinlets proceeding from it, bearing linear sori extending from the midrib almost to the margin; indusia of the section, single or double; upper pinnæ gradually smaller and more entire, the uppermost semi-decurrent or confluent.—Bedd. Ferns S. Ind. t. 161.

Queensland. Rockingham Bay, *Dallachy.*

Extends over tropical Africa and Asia including the Malayan Archipelago.

18. **A. maximum**, *Don; Hook. and Bak. Syn. Filic.* 239.—Trunk erect, from a few in. to 2½ ft. high. Fronds bipinnate, several feet long and 2 to 3 ft. broad, the larger pinnæ closely resembling the entire fronds of *A. sylvaticum*. Secondary pinnæ lanceolate, acuminate, 3 to 6 in. long, ¾ to 1 in. broad, pinnatifid with short broad denticulate lobes, but the larger ones more deeply so than in *A. sylvaticum* and the smaller lobes more oblique and acutely toothed, the pinnæ ending in a long lanceolate serrated point, the rhachis glabrous or slightly scaly. Sori narrow-linear and indusia entirely those of *A. sylvatica*, to which the species is referred by F. Muell. Fragm. v. 133.

Queensland. Rockingham Bay, *W. Hill, Dallachy;* Daintree River, *Fitzalan.*
N. S. Wales. Richmond River, *C. Moore* (referred in Syn. Filic. 235 to *A. speciosum*, Metten. under the impression that the specimens sent were whole fronds) Macleay River, *Fitzgerald;* Tweed River, *Guilfoyle.*

Common in East India.

19. **A. polypodioides**, *Metten.; Hook. Spec. Filic.* iii. 257, *Syn. Filic.* 238. — Trunk erect, attaining sometimes 3 or 4 ft. Fronds bipinnate, several feet long, 1 to 2 ft. broad, the stipes and rhachis without scales. Secondary pinnæ mostly 3 to 4 in. long, lanceolate, shortly petiolate, acuminate, more or less deeply pinnatifid towards the base, the lower lobes lanceolate, falcate, minutely serrulate, the upper ones gradually shorter. Sori on the pinnate veins of the lobes as in the preceding species, but much shorter, rather oblong than linear. Indusia of the section opening on one or both sides of the vein.—F. Muell. Fragm. v. 132; *Diplasium polypodioides*, Metten.; Bedd. Ferns S. Ind. t. 163.

Queensland. Rockingham Bay, growing frequently in water, *Dallachy;* Daintree River, *Fitzalan;* Dalrymple Creek, *Hartmann.*

Spread over East India and the Malayan Archipelago.

20. **A. melanochlamys**, *Hook. Spec. Filic.* iii. 259, *Syn. Filic.* 239. —Trunk unknown. Fronds bipinnate, 6 ft. long and 1 to 2 ft. broad, widely spreading, darker coloured and not so membranous as the preceding species. Secondary pinnæ deeply pinnatifid; segments from oblong rounded and under ½ in., to lanceolate and above 1 in. long and then usually crenate with a tooth opposite each sorus. Sori and indusia linear, very conspicuous from their dark almost black colour, reaching usually almost from the midrib to the margin.

N. S. Wales. Lord Howe's Island, *M'Gillivray, Milne, C. Moore*, and others.

21. **A. decussatum**, *Swartz; Hook. Spec. Filic.* iii. 270, *Syn. Filic.* 243.—Trunk erect, scaly. Fronds 3 to 4 ft. long, pinnate, with a thick smooth rhachis. Pinnæ shortly petiolate or attached by the midrib only, lanceolate, acuminate, 6 in. to near 1 ft. long, 1 to 1½ in.

broad, shortly dentate or some of the larger ones pinnatifid or almost pinnate. Primary veins proceeding obliquely from the midrib to the teeth or lobes, with secondary obliquely pinnate veinlets often anastomosing. Sori linear, on the secondary veinlets, with the single or double indusium of the section.—*Callipteris prolifera,* Bory; Bail. Queensl. Ferns, 32.

Queensland. Rockingham Bay, *W. Hill, Dallachy;* Daintree River, *Fitzalan.*

Also in tropical Africa, the Malayan Archipelago and Pacific Islands.

31. CYSTOPTERIS, Bernh.

Delicate ferns, with twice or thrice pinnate fronds, with small dentate segments. Veins forked or pinnate, with free venules. Sori small, globular, attached to the concave base of an ovate indusium fixed on a venule at a distance from the margin.

A small genus spread over the temperate or mountain regions of both the northern and southern hemispheres, the only Australian species the most common in the general area of the genus. It is generally placed near *Davallia* on account of the concave indusium, but the position of the sori and the texture and early disappearance of the indusium show an affinity to *Aspidium,* in which the spore-cases are frequently affixed in part to the indusium, though never wholly so as in *Cystopteris.*

1. **C. fragilis,** *Bernh.; Hook. Spec. Filic.* i. 197, *Brit. Ferns, t.* 23, *Syn. Filic.* 103.—Rhizome creeping, scaly. Fronds usually 6 to 9 in. high, ovate-lanceolate or oblong in their outline, twice pinnate, the longest primary pinnæ 1 to 1½ in. long, decreasing towards both ends, on a slender stipes without scales. Segments ovate or lanceolate, pinnatifid or dentate, with obtuse lobes or teeth. Sori several on each segment, at first enclosed in the indusium which is small and thin in the Australian specimens and soon disappears under the enlarged globular sori.—Hook. f. Fl. Tasm. ii. 136, t. 166; Bedd. Ferns Brit. Ind. t. 91 (the indusium in all the figures larger than in any Tasmanian specimens); *C. tasmanica,* Hook. Spec. Filic. i. 199, Ic. Pl. t. 959.

Tasmania. Moist rocks, Mount Olympus and Lake St. Clair, *Gunn.*

32. ASPIDIUM, Swartz.

Rhizome thick and shortly erect or creeping. Fronds once twice or thrice pinnate, rarely in species not Australian, simple. Sori orbicular, usually small, variously dispersed over the under surface. Indusium orbicular, covering the sorus when young, attached by the centre or by a point or in a sinus on one side, so that when opened all round by the growth of the spore-cases it becomes peltate or more or less reniform.

A large genus, distributed over every part of the globe, closely allied to *Polypodium*, with nearly as great a variety of division and venation of the frond, differing only in the presence of an indusium which in several species disappears very early. Of the 16 Australian species four have a very general distribution in the New and the Old World, seven are limited to the Old World, chiefly in Asia and the Pacific Islands, two others are in New Zealand, one of them also in the Pacific Islands, the three remaining ones are as far as known endemic.

Fronds pinnate, with numerous nearly equal pinnæ articulate on a long rhachis. Sori in a regular row close to or not far from the margin (**Nephrolepis**).
  Pinnæ rather rigid, obliquely truncate or cordate at the base.
    Pinnæ rarely above 1 in. long, obliquely cordate . . . 1. *A. cordifolium.*
    Pinnæ 2 to 5 in., obliquely truncate at the base . . . 2. *A. exaltatum.*
  Pinnæ membranous, narrow and tapering at the base on one side, broadly auriculate on the other . . . . 3. *A. ramosum.*
Fronds pinnate. Pinnæ pinnatifid, with a pinnate vein leading to each lobe, the veinlets under adjoining lobes uniting in a vein leading to the sinus (**Nephrodium**).
  Lower pinnæ scarcely smaller than the others.
    Sori in 2 rows near the margins of the lobes usually continued into the entire part . . . . 4. *A. unitum.*
    Sori close to the margins of the lobes and not continued below the sinus . . . . 5. *A. pteroides.*
  Lower pinnæ gradually much smaller and distant.
    Fronds rarely above 2 ft. long. Lobes of the pinnæ rather obtuse or acute . . . . 6. *A. molle.*
    Fronds often 4 to 5 ft. long. Lobes of the pinnæ broad, very obtuse or truncate . . . . 7. *A. truncatum.*
Fronds deeply pinnatifid or pinnate, with reticulately veined pinnæ (**Sagenia**) . . . . 8. *A. confluens.*
Fronds twice or thrice pinnate with lobed or toothed segments. Indusium usually peltate (**Polystichum**).
  Stipes very shaggy. Segments ovate-lanceolate, prickly toothed, with an angular lobe at the base . . . . 9. *A. aculeatum.*
  Stipes slightly scaly. Segments lanceolate, pinnatifid or pinnate, the teeth mostly aristate . . . . 10. *A. aristatum.*
  Segments lanceolate, coriaceous, obtusely toothed lobed or pinnate . . . . 11. *A. capense.*
Fronds twice or thrice pinnate with lobed or toothed segments. Indusium usually reniform, often very small and soon disappearing, sometimes abortive (**Lastrea**).
  Fronds glabrous or pubescent.
    Segments rather coriaceous, obtusely toothed or lobed. Sori in marginal lines at the upper end . . . . 12. *A. apicale.*
    Segments acutely toothed or lobed. Sori near the midrib . . . . 13. *A. decompositum.*
    Segments acutely toothed or pinnatifid. Sori near the margin . . . . 14. *A. tenerum.*
  Pinnæ and pinnules ciliate with white hairs or bristles . . . . 15. *A. tenericaule.*
  Stipes and principal rhachis hispid with long dark hairs or bristles. Pinnules and segments acutely toothed . . . . 16. *A. hispidum.*

1. **A. cordifolium**, *Swartz, Syn. Filic.* 45.—Rhizome emitting wiry fibres bearing ovoid scaly tubers (stolones?). Fronds 1 to 2 ft. long, weak, simply pinnate. Pinnæ very numerous and regularly approximate, nearly sessile but articulate on the rhachis, oblong, rounded and usually denticulate at the end, ¾ to 1 in. long, obliquely cordate at the base with the upper auricle much the largest, gradually smaller at the end of the frond, and the lowest pinnæ short broad and barren. Veins obliquely diverging from the midrib, forked or branched. Sori terminating each lower branch, forming a row at some distance from the margin. Indusium orbicular, very prominent, attached in a deep sinus or rarely peltate.—*Nephrolepis cordifolia*, Presl; Hook. and Bak. Syn. Filic. 300; *Aspidium tuberosum*, Bory; F. Muell. Fragm. v. 136; *Nephrolepis tuberosa*, Presl; Hook. Spec. Filic. iv. 151; Bedd. Ferns S. Ind. t. 92.

Queensland. Rockingham Bay, *Dallachy*; Brisbane River, Moreton Bay, *W. Hill*, *F. Mueller*.

N. S. Wales. Clarence River, *Beckler*; Richmond River, *C. Moore*, *Mrs. Hodgkinson*; Lord Howe's Island, *C. Moore*, *Fullagar*.

Spread over the tropical regions of the New and the Old World.

2. **A. exaltatum**, *Swartz, Syn. Filic.* 45.—Fronds weak, often above 2 ft. long, simply pinnate, the rhachis glabrous or loosely scaly-tomentose. Pinnæ very numerous, nearly sessile but articulate on the rhachis, lanceolate, mostly acuminate and crenate, obliquely truncate at the base and sometimes auriculate on the upper side, the longer ones 3 to 5 in. long, with numerous fine forked veins obliquely diverging from the midrib, the lower pinnæ usually shorter rounded at the end and barren. Sori terminating one branch of the veins, forming a regular row usually close to the margin. Indusium orbicular, laterally attached in a deep sinus or sometimes peltate and opening all round.—F. Muell. Fragm. v. 136; *Nephrodium exaltatum*, R. Br. Prod. 148; *Nephrolepis exaltata*, Schott; Hook. Spec. Filic. iv. 152, Syn. Filic. 301.

N. Australia. North Coast, *M'Kinlay*; Liverpool River, *Gulliver*.

Queensland. Port Bowen, *R. Brown*, *A. Cunningham*; Cape York, *Daemel*; York Peninsula, *N. Taylor*; Endeavour River, *A. Cunningham*; Rockingham Bay, *W. Hill*, *Dallachy*; Daintree River and Port Denison, *Fitzalan*; Gilbert River, *Daintree*; islands off the coast, *M'Gillivray*, *Thozet* and others.

Widely spread over the tropical regions of the New and the Old World.

Var. *longipinna*. Larger pinnæ 6 in. long, ½ to ¾ in. broad, with the row of sori at a considerable distance from the margin.—North coast, *M'Kinlay*; Rockingham Bay, *Dallachy*.

3. **A. ramosum**, *Beauv. Fl. Ow. et Ben.* ii. 53, *t.* 91.—Rhizome slender, scaly, creeping up the stems of trees to a great length. Fronds weak, varying from a few inches to above 1 ft. long. Pinnæ numerous, obliquely oblong, obtuse, crenate, very oblique at the base, articulate on the rhachis, the lower side narrowed the upper broadly truncate

and often auriculate, 1 in. long and 3 to 4 lines broad in the larger fronds, ¼ in. long and 1 to 1½ lines broad in the smaller ones, with every intermediate size. Veins diverging from the midrib once or twice forked. Sori in a regular row between the midrib and the margin. Indusium orbicular, usually attached in a deep sinus, but sometimes peltate.—*Nephrolepis ramosa*, T. Moore; Hook. and Bak. Syn. Filic. 301; *Nephrodium obliteratum*, R. Br. Prod. 148; *Aspidium obliteratum*, Spreng. Syst. iv. 99; F. Muell. Fragm. v. 135; *Nephrolepis obliterata*, Hook. Spec. Filic. iv. 154; Bedd. Ferns S. Ind. t. 251; *Polypodium? Beckleri*, Hook. Spec. Filic. iv. 224; *N. repens*, Brackenr.; Bail. Queensl. Ferns, 50; *N. altescandens*, Bail. l. c. 51, not of Baker.

Queensland. Endeavour River, *Banks and Solander*, *A. Cunningham;* Cape York Peninsula, *Hahn's Expedition*, *N. Taylor*; Rockingham Bay, *Dallachy;* Daintree River, *Fitzalan;* Dalrymple Creek, *Hartmann.*

N. S. Wales. Cape Byron, Tweed, Bellinger and Richmond Rivers, *C. Moore;* New England, *C. Stuart;* Macleay River, *Beckler;* Berrima and Illawarra, *Macarthur*, *C. Moore* and others.

Spread over tropical Africa and Asia and the Pacific Islands.

4. **A. unitum,** *Swartz., Syn. Fil.* 47.—Rhizome stout, creeping. Fronds 1 to 2 ft. long on a stipes often as long, simply pinnate, pubescent or rarely glabrous. Pinnæ narrow-lanceolate, 3 to 6 in. long, sessile but not adnate or the lower ones shortly petiolate, rather firm, regularly pinnatifid, the lobes usually reaching to about the middle, broad, rather acute, often falcate. Veins pinnate to each lobe, the branches or veinlets of adjoining lobes uniting in a vein leading to the sinus. Sori at the end of the veinlets forming usually a close row along the margin of the lobes. Indusium orbicular-reniform or almost peltate, very small and soon disappearing.—F. Muell. Fragm. v. 135; *Nephrodium unitum*, R. Br. Prod. 148; *N. propinquum*, R. Br. l. c.; Hook. Spec. Filic. iv. 79.

N. Australia. Near Providence Hill, *F. Mueller.*

Queensland. Endeavour River, *Banks and Solander;* Lizard Island, *M'Gillivray;* York Peninsula, *N. Taylor;* Rockingham Bay, *Dallachy*; Port Denison, *Fitzalan;* Rockhampton, *Thozet;* Brisbane River, Moreton Bay, *A. Cunningham*, *F. Mueller.*

N. S. Wales. Port Jackson, *A. Cunningham;* New England, *C. Stuart;* Tweed River, *C. Moore;* Richmond River, *Mrs Hodgkinson;* also in *Leichhardt's* collection.

W. Australia, *Drummond, n.* 400.

Widely spread over tropical Africa and Asia and closely allied to the common tropical American *A. serra*, Sw.; Brown restricted the name of *unitum* to the glabrous form to which belong a few of the Queensland specimens, and distinguished the more or less pubescent one which is the most common, as *N. propinquum*, relying however apparently only on the single specimens of each in Herb. Banks.

5. **A. pteroides,** *Swartz, Syn. Filic.* 47.—Nearly allied to *A. unitum*, with the same pinnatifid pinnæ and venation. Fronds taller,

glabrous or minutely pubescent. Pinnæ membranous, usually 6 to 8 in. long and about ½ in. broad, mostly petiolate, the lower ones scarcely smaller, the lobes reaching about ¾ way to the midrib. Sori rather large, in close marginal rows. Indusium orbicular-reniform.—*Nephrodium terminans*, Hook. Spec. Filic. iv. 73 ; *N. pteroides*, J. Sm.; Hook. and Bak. Syn. Filic. 289.

Queensland. Rockingham Bay, *Dallachy.*

Spread over tropical Asia and the Pacific Islands.

6. **A. molle,** *Swartz, Syn. Filic.* 49.—Rhizome short and thick. Fronds 1 to 2 ft. long on a stipes often as long, simply pinnate, glabrous or hirsute, usually of a light green. Pinnæ lanceolate, the longer ones 3 to 6 in. long or even more, often acuminate, regularly pinnatifid, the lobes sometimes short sometimes reaching above halfway to the midrib, the pinnæ truncate at the base, mostly sessile, the lower ones gradually smaller and more distant. Veins pinnate in each lobe and prominent, the branches or veinlets of adjoining lobes united in a vein tending to the sinus. Sori usually in a row about halfway between the midrib of the lobe and the margin. Indusium orbicular-reniform, soon disappearing.—F. Muell. Fragm. v. 135; *Polypodium molle*, Jacq. Ic. Rar. t. 640; *Nephrodium molle*, R. Br. Prod. 149; Hook. Spec. Filic. iv. 67, Syn. Filic. 293; Bedd. Ferns S. Ind. t. 84.

N. Australia. Johnstone River, *Gulliver.*
Queensland. York Peninsula, *N. Taylor;* Rockingham Bay, *W. Hill, Dallachy;* Bowen, *Woolls;* Brown River, *M'Gillivray;* Port Denison and Daintree River, *Fitzalan;* Rockhampton, *Bowman, O'Shanesy;* Moreton Bay, *F. Mueller, C. Stuart.*
N. S. Wales. Blue Mountains, *R. Brown;* New England, *C. Stuart;* Hastings, Macleay and Clarence Rivers, *Beckler* and others; Richmond River, *Mrs. Hodgkinson;* Illawarra, *Johnson;* Lord Howe's Island, *C. Moore.*

Var. *didymosorus.* Sori 1 or 2 to each lobe and only at the junction of the lowest veinlets of adjoining lobes.—*Nephrodium didymosorum*, Bedd. Ferns Brit. Ind. t. 200.—Rockingham Bay, *Dallachy.*

The genus is spread over tropical Asia and Africa and the Pacific Islands.

7. **A. truncatum,** *Gaudich. in Freyc. Voy. Bot.* 332, *t.* 10.—Very closely allied to *A. molle*, and difficult to distinguish by any positive characters. Usually a larger plant, the fronds often 4 or 5 ft. high and sometimes more, the larger pinnæ 6 in. to 1 ft. long, the lobes more obtuse, often quite truncate.—*Nephrodium truncatum*, Presl; Hook. and Bak. Syn. Filic. 294; *N. abruptum*, Presl; Hook. Spec. Filic. iv. 77, t. 241; Bedd. Ferns S. Ind. t. 86; *Aspidium extensum*, F. Muell. Fragm. v. 135, but scarcely of Blume.

Queensland. A specimen from Rockingham Bay is referred here by Baker but is rather doubtful.

N. S. Wales. Duck Creek, Richmond River, *C. Moore;* Tweed River, *Guilfoyle.*

Also in tropical Asia and the Pacific Islands.

8. **A. confluens,** *Metten. in Linnæa,* xxxvi. 125.—Fronds 1 to 2 ft. long or rather more, deeply pinnatifid or pinnate at the base. Segments lanceolate, often numerous, the upper ones 2 to 6 in. long, pinnately toothed or lobed, confluent on the broadly winged rhachis, the intermediate ones 6 to 10 in. long, deeply pinnatifid and decurrent on the rhachis, the lowest pair quite free at the base, pinnatifid with long lanceolate lobes, of which the outer ones are again pinnatifid, all membranous. Veins copiously netted. Sori scattered, either on short veinlets free in the areoles or on the anastomosing veinlets. Indusium when perfect rather large, orbicular, peltate or on the same frond attached by a deep sinus.—*Nephrodium confluens,* F. Muell.; Hook. and Bak. Syn. Filic. 504; *A. melanocaulon,* F. Muell. Fragm. v. 133, not of Blume; *Sagenia melanocaulon,* Bail. Queensl. Ferns, 47.

N. Australia. Johnstone River, *Gulliver.*
Queensland. Rockingham Bay, *Dallachy;* Daintree River, *Fitzalan;* York Peninsula, *N. Taylor.*

9. **A. aculeatum,** *Swartz; Hook. Spec. Filic.* iv. 18, *Brit. Ferns, t.* 10 *to* 12, *Syn. Filic.* 252.—Rhizome short and thick. Fronds 1 to 2 ft. high, twice pinnate, the lower part of the stipes and the whole frond when young very shaggy with dark brown scarious scales mixed with hairlike ones. Primary pinnæ lanceolate in outline, 1½ to 4 in. long, the lower ones decreasing in length; pinnules ovate-lanceolate, curved, 3 to 6 lines long, prickly-toothed, with a prominent angle or lobe on the upper or inner side. Veins forked, diverging from the midrib. Sori usually 6 to 8 on each pinnule.—F. Muell. Fragm. v. 134; Sieb. Syn. Filic. n. 104; *A. proliferum,* R. Br. Prod. 147; *Polystichum vestitum,* Presl; Hook. f. Fl. Tasm. ii. 148.

Queensland. Head of Dalrymple Creek, *Hartmann.*
N. S. Wales. Port Jackson, *Woolls;* Clarence River, *Beckler;* Richmond River, *C. Moore;* Macleay River, *Fitzgerald;* Illawarra, *Johnson.*
Victoria. From Portland and the Grampians to Gipps' Land, *F. Mueller* and others.
Tasmania. Derwent River, *R. Brown;* abundant in subalpine situations, *J. D. Hooker.*

In most temperate and subtropical regions of the globe.

10. **A. aristatum,** *Swartz; Hook. Spec. Filic.* iv. 27, *Syn. Filic.* 255. —Fronds 1 to 2 ft. high, broadly ovate-triangular in outline, twice pinnate or the lower pinnæ again pinnate at the base, firm but thin, light green and glossy, the stipes scaly-hairy at the base. Pinnules or segments very obliquely oblong or lanceolate, ½ to 1 in. long, narrowed or cuneate at the base, bordered at the end by a few teeth ending in

bristle-like points. Veins forked, diverging from the midrib. Sori small, not numerous, loosely arranged in 2 rows. Indusium small, orbicular-reniform.—F. Muell. Fragm. v. 134; *Lastrea aristata*, T. Moore; Bail. Queensl. Ferns, 49.

Queensland. Rockingham Bay, *Dallachy;* Port Denison, *Fitzalan.*
N. S. Wales. New England, *C. Stuart* (with fronds thrice pinnate); Hastings River, *Beckler;* Tweed River, *Guilfoyle;* Illawarra, *C. Moore.*

Spread over Eastern Asia from the Himalayas to Japan, in the Pacific Islands and South Africa.

11. **A. capense,** *Willd.; Hook. and Bak. Syn. Filic.* 254.—Rhizome creeping. Fronds from under 1 ft. to 2 ft. high, usually broad, rigid, the stipes and rhachis more or less scaly, mostly twice pinnate but the smaller ones occasionally simply pinnate. Pinnæ coriaceous, lanceolate, toothed or pinnatifid, with reticulate veins concealed in the thick tissue. Sori often large, 1 to each tooth or lobe. Indusium peltate and rigid, but fallen away from old sori.—*Polypodium capense*, Linn.; *Aspidium coriaceum*, Swartz; Hook. Spec. Filic. iv. 32; R. Br. Prod. 148; F. Muell. Fragm. v. 134; *Polystichum coriaceum*, Schott; Hook. f. Fl. Tasm. ii. 148.

N. S. Wales. Port Jackson to the Blue Mountains, *Woolls;* Macleay River. *Fitzgerald;* Twofold Bay, *F. Mueller;* Lord Howe's Island, *C. Moore*, with a large variety with compound fronds and a very shaggy rhachis.
Victoria. Mount Disappointment and Apollo Bay, *F. Mueller;* Cape Howe, *Walter.*
Tasmania. Derwent River, *R. Brown;* not uncommon in forests, etc., *J. D. Hooker.*

Generally spread over the tropical and southern extratropical regions of the globe.

12. **A. apicale,** *Baker.*—Fronds in general outline and division those of the larger broader specimens of *A. decompositum*, twice or thrice pinnate with pinnatifid pinnules, but of a firmer texture. Segments obtusely toothed or lobed, with 1 or 2 sori on the longer teeth forming usually a marginal line round the upper part of the segment. Veins pinnate with free venules. Indusium orbicular-reniform, much larger and more persistent than in any variety of *A. decompositum*, or *A. tenerum.*—*Nephrodium apicale*, Bak. Syn. Filic. 499.

N. S. Wales. Lord Howe's Island, *C. Moore.*

13. **A. decompositum,** *Spreng. Syst.* iv. 109.—Rhizome short and thick or longer and creeping. Fronds glabrous or the rhachis and primary nerves pubescent, very variable in size and outline, the smaller ones ovate-lanceolate, 6 in. to near 1 ft. long, on a stipes often nearly as long, pinnate with deeply pinnatifid pinnæ, the larger ones twice as long, much broader in proportion and thrice pinnate. Primary and secondary pinnæ ending in a narrow pinnatifid apex. Pinnules or

segments lanceolate, 2 to 3 lines broad, pinnately toothed or lobed, the teeth acute or mucronate and the margin of the lobes usually nerve-like. Veins pinnate, more or less divided according to the division of the pinnules. Sori usually 1 or 2 to each principal lobe not very far from the midrib. Indusium orbicular-reniform often concealed as the sorus enlarges, and sometimes perhaps deficient from the first.—F. Muell. Fragm. v. 136; *Nephrodium decompositum*, R. Br. Prod. 149; Hook. Spec. Filic. iv. 146, Syn. Filic. 281; Hook. f. Fl. Tasm. ii. 149, Fl. N. Zel. t. 79; *Lastrea decomposita*, Presl; Bail. Queensl. Ferns, 49.

Queensland. Broad Sound, *R. Brown;* Rockingham and Cleveland Bay, *Dallachy;* Bowen, *Woolls;* Brisbane River, Moreton Bay, *Fraser, C. Stuart;* Rockhampton and other localities in South Queensland, *Thozet* and others.
N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown* and others; New England, *C. Stuart;* Hastings, Macleay and Clarence Rivers, *Beckler;* Richmond River, *Mrs. Hodgkinson;* Tweed River, *Guilfoyle;* Illawarra, *A. Cunningham, C. Moore.*
Victoria. Wannon River, *Robertson;* numerous localities from Dandenong and Western Port to Genoa River, *F. Mueller* and others.
Tasmania. Woods around Hobarton, *Gunn, J. D. Hooker;* Cuming's Head, *C. Stuart.*
S. Australia. Penola, *Woods.*

Also in New Zealand and the Pacific Islands.

Some specimens with small fronds and broader, more membranous and less acute segments appear almost identical with specimens of *Polypodium rufescens*, Blume, from Ceylon. The supposed Australian specimens of that species are undoubtedly referrible to *A. decompositum*, and *Nephrodium lancilobum*, Bak. Syn. Filic. 499, appears to me to be inseparable from the larger more divided specimens of the same species.

14. **A. tenerum,** *Spreng. Syst.* iv. 109.—Very near *A. decompositum* and varies like it in the fronds twice or thrice pinnate, with the lobes or teeth acute, but the pinnules and segments are more regular and more regularly pinnately lobed or dentate, the parallel branches of the veins much more numerous, and the sori are close to the margin at a distance from the midrib.—*Nephrodium tenerum*, R. Br. Prod. 149.

Queensland. Keppell Bay, *R. Brown;* Mount Elliott, *Fitzalan;* Mount Mueller, *Dallachy;* Rockhampton, *Bowman;* Moreton Bay, *C. Stuart.*
N. S. Wales. Richmond River, *Henderson, Mrs. Hodgkinson;* Bellinger River, *Fitzgerald;* Tweed River, *Guilfoyle.*

15. **A. tenericaule,** *Thw. Enum. Pl. Ceyl.* 393.—Rhizome short and thick or creeping. Fronds 1 to 3 ft. long on a stipes of 1 to 2 ft., twice pinnate, the larger primary pinnæ 6 to 8 in. long. Pinnules lanceolate, 1 to 1½ in. long on the larger pinnæ, very deeply pinnatifid with numerous lanceolate lobes 1 to 3 lines long, all more or less decurrent, ciliate on the margins as well as the principal veins and rhachis with rigid white hairs or bristles. Veins branched in each lobe but free. Sori 1 to 6 in each lobe, small and distinct with few spore-

cases, or larger and confluent. Indusium very small and only to be seen on young sori.—F. Muell. Fragm. v. 133; *Nephrodium tenericaule*, Hook. Spec. Filic. iv. 142, t. 269; *Aspidium uliginosum*, Kunze in Linnæa, xx. 6; Metten. in Ann. Mus. Lugd. Bat. i. 229; *Lastrea flaccida*, Bedd. Ferns S. India, t. 99; *Nephrodium setigerum*, Bak. Syn. Filic. 284.

Queensland. Rockingham Bay, *W. Hill, Dallachy*; Bowen, *Woolls*; Daintree River, *Fitzalan*.
N. S. Wales. Clarence River, *Herb. F. Mueller*.

Spread over tropical Asia from Ceylon and the Archipelago to Japan and the Pacific Islands.

16. **A. hispidum**, *Swartz, Syn. Fil.* 56.—Rhizome thick, creeping, covered with brown scales. Fronds 1 to 2 ft. long, broadly ovate or triangular in outline, usually thrice pinnate with acuminate pinnæ, the stipes and primary and secondary rhachis hispid with long fine spreading dark-coloured hairs or bristles. Pinnules lanceolate, deeply pinnatifid, ¼ to ½ in. long, deeply and sharply toothed. Veins solitary to each lobe or tooth. Sori solitary on the smaller segments or lobes. Indusium orbicular, attached by a lateral sinus or almost peltate.—F. Muell. Fragm. v. 133; *Nephrodium hispidum*, Hook. Spec. Filic. iv. 150, Syn. Filic. 286; *Aspidium setosum*, Schkuhr, Filic. t. 49.

Victoria. Cape Otway Ranges, *Wilkinson*.

Also in New Zealand.

33. POLYPODIUM, Linn.

Rhizome creeping in all the Australian species, with small brown scales with a broad adnate base and more or less acute or subulate points. Fronds simple pinnate or compound. Sori orbicular very rarely oblong, variously dispersed over the under surface, without any indusium.

A large genus distributed over every part of the globe except the coldest or high alpine regions. Of the 24 Australian species, 12 belong to the Indo-Australian region extending over the Malayan Archipelago, more or less into East India and the Pacific Islands, a few of them also African, but none of them identified with American species, 7 are in New Zealand or the South Pacific Islands or in both, 2 more are common to New Zealand and the extreme south of America, the remaining 3 appear to be endemic.

In the Australian species, where the frond is small, the creeping rhizomes usually form dense matted patches on rocks and trunks of trees, in the larger species the rhizome often creeps up the trunks of trees to a great length. In most species the stipes is more or less distinctly articulate on the rhizome.

Series I. **Dianeura.**—*Veins diverging from the midrib forked or branched, the branches not anastomosing. Sori terminating or near the end of one of the branches.*

Fronds coriaceous, entire or pinnatifid, glabrous or ciliate-hairy, the venation usually concealed in the thick texture of the frond (**Eupolypodium**).

Fronds entire, glabrous. Sori oblong or linear . . . 1. *P. australe.*
Fronds entire, ciliate with long brown hairs . . . . 2. *P. Hookeri.*
Fronds pinnatifid with short lanceolate entire lobes . 3. *P. blechnoides.*
Fronds pinnatifid with linear dentate or pinnatifid lobes . . . . 4. *P. grammitidis.*

(No corresponding *Aspidia.*)

Fronds pinnate, with numerous undivided pinnæ articulate on the rhachis (**Arthropteris**) . . . . . . 5. *P. tenellum.*

(See sect. *Nephrolepis* of *Aspidium*).

Fronds decompound, twice or thrice pinnate with pinnatifid pinnules (**Phegopteris**) . . . . 6. *P. punctatum.*

(See sect. *Lastrea* of *Aspidium*).

Series II. **Synneura.**—*Branches of parallel primary veins uniting but not reticulate.*

Fronds pinnate. Pinnæ broadly crenate or equally pinnatifid, with a pinnate vein leading to each lobe, the veinlets under adjoining lobes uniting in an intermediate vein leading to the sinus (**Goniopteris**).

Fronds spreading, proliferous. Pinnæ 1 to 4 in. long. Sori chiefly near the margin . . . . 7. *P. proliferum.*
Fronds tall, erect, Pinnæ 6 to 12 in. Sori in 2 parallel rows between each 2 primary veins . . . 8. *P. urophyllum.*
Fronds erect, densely villous . . . . 9. *P. Hillii.*

(See also sect. *Nephrodium* of *Aspidium*).

Fronds and venation of *Goniopteris* except that the branches of the primary veins anastomose but do not form a parallel intermediate vein . . . . . 10. *P. pœcilophlebium.*

Series III. **Dictyoneura.**—*Venation reticulate between more or less distinctly parallel primary veins, with a small free usually clavate veinlet in a few or in many of the areolæ. Sori on the free or on the connecting veinlets.*

Fronds coriaceous, entire or rarely forked, covered with stellate hairs or scales, the fertile ones narrow, the barren often short and broad. Venation concealed in the thick texture (**Niphobolus**).

Fronds under 1 in. long. Sori rather large, irregularly placed often contiguous. Scales very dense . . 11. *P. serpens.*
Fronds 3 to 12 in. long. Sori large, oval, in a single row on each side of the midrib. Scales small . . 12. *P. confluens.*
Fronds 6 in. to 2 ft. long Sori small, very numerous, and densely crowded in many rows. Scales minute . . . . 13. *P. acrostichoides.*

Fronds without stellate scales. Sori large and distant in a single row (or 2 in *P. phymatodes*) on each side of the midrib, each sorus in a cavity forming a pustule on the upper surface (except *P. simplicissimum*) (**Goniophlebium** and **Phymatodes**).

Fronds long and narrow, entire or crenate.
Fronds coriaceous smooth and shining, the venation concealed in the texture . . . . 14. *P. attenuatum.*
Fronds rigidly membranous, the larger veins conspicuous . . . . 15. *P. simplicissimum.*
Fronds deeply pinnatifid with long segments confluent in a broad wing to the rhachis.
Fronds usually above 1½ ft. high.
Segments membranous, showing the veins, 6 in. to 1 ft. long, 1 to 1½ in. broad, with narrow points . . . . 16. *P. nigrescens.*
Segments smooth, the veins inconspicuous, 4 to 8 in. long, ¾ to 1½ in. broad . . . . 17. *P. phymatodes.*
Fronds usually under 1½ ft. high.
Segments rather firm, showing the primary veins, 3 to 6 in. long, 4 to 8 lines broad . . . . 18. *P. pustulatum.*
Segments membranous, smooth, the veins scarcely conspicuous, rarely above 3 in. long . . . 19. *P. scandens.*
Fronds pinnate, the pinnæ articulate on the rhachis at least when fertile.
Pinnæ membranous, 6 to 8 in. long, ½ to 1 in. broad, cuneate at the base . . . . 20. *P. verrucosum.*
Pinnæ 3 to 6 in. long, 3 to 5 lines broad, serrate, truncate or auriculate on the base . . . . . 21. *P. subauriculatum.*
Pinnæ rigid, 3 to 9 in. long, 3 to 9 lines broad, cuneate at the base. Barren fronds sessile, short and broad . . . . 22. *P. rigidulum.*
Fronds without stellate scales. Sori irregularly scattered or in several rows, with a very slight or no corresponding prominence on the upper surface.
Fronds entire, long and broad. Sori numerous and small . . . . 23. *P. irioides.*
Fronds deeply pinnatifid with long segments confluent in a broad wing to the rhachis. Sori large, in about 2 rows.
Venation inconspicuous. Single free veinlets in several areolæ. Receptacle prominent on the upper surface . . . . 17. *P. phymatodes.*
Venation conspicuous. Sori at the junction of 2 veinlets. No single free veinlets . . . . . *P. aureum.*
Fronds deeply pinnatifid. Sori numerous and small. Barren fronds sessile, short and broad . . . . . 24. *P. quercifolium.*

(See also sect. *Sagenia* in *Aspidium.*)

SERIES 1. DIANEURA.—Veins pinnate, the venules diverging from a midrib, simple or forked, the branches free. Sori inserted on a simple branch or fork, the other fork often again forked.

1. **P. australe,** *Metten; Hook. Spec. Filic.* iv. 167, *Syn. Filic.* 322.—Fronds entire, coriaceous, glabrous, linear or oblanceolate, usually 3 or 4 in. long but on high mountains reduced to about ½ in., or when very luxuriant above 6 in., obtuse, contracted into a short stipes. Veins, diverging from the midrib, once or twice forked, free, but con-

cealed in the thick substance of the frond. Sori oblong or linear almost as in *Grammitis*, rather large, oblique and parallel in a single row on each side of the midrib, and when old often confluent covering nearly the whole surface.—F. Muell. Fragm. v. 127; *Grammitis australis*, R. Br. Prod. 146; Hook. f. Fl. Tasm. ii. 151; Sieb. Fl. Mixt. n. 235; *G. Billardieri*, Willd. Spec. v. 139; *Polypodium diminutum*, Bak. Syn. Fil. 507.

Queensland. Mount Lindsay, *W. Hill;* Maroochie River, *Bailey.*
N. S. Wales. Port Jackson, *R. Brown*, *A. Cunningham;* New England, *C. Stuart;* Mountains on Bellinger River at an elevation of 5000 ft., *C. Moore;* Tweed River, *Guilfoyle;* Macleay River, *Fitzgerald;* Illawarra, *Johnson;* Lord Howe's Island, *C. Moore*, *Fullagar.*
Victoria. Mount Juliet, *Sullivan;* Dandenong Ranges, Apollo Bay, Mount Baw-Baw, etc., *F. Mueller;* Cape Howe, *Walter.*
Tasmania. Derwent River, *R. Brown;* abundant on damp rocks and trunks of trees throughout the island, ascending to 4500 ft., *J. D. Hooker.*

Also in New Zealand and the extreme south of America.

2. **P. Hookeri,** *Brackenr.; Hook. Spec. Filic.* iv. 171, *Syn. Filic.* 319.—Fronds entire linear or lanceolate as in *P. australe* and sometimes as small, but often 6 to 8 in. long, and not quite so coriaceous, tapering into a very short stipes and always fringed and sprinkled with long spreading dark hairs. Veins rather more divided than in *P. australe.* Sori orbicular oval or shortly oblong, rather large, in a single row on each side of the midrib.—*P. setigerum*, Hook. and Arn. Bot. Beech. 103, t. 21, but scarcely of Blume.

Queensland. Rockingham Bay, *Dallachy.*
N. S. Wales. Lord Howe's Island, *C. Moore*, *Fitzgerald.*

Also in the Philippines and the Sandwich Islands. It is very closely allied to the true *P. setigerum*, Blume (*Grammitis fasciculata*, Blume, Fl. Jav. Filic. t. 47. f. 2; Hook. Ic. Pl. t. 941), but that has always the frond more abruptly contracted into a much longer stipes which gives it a different facies.

3. **P. blechnoides,** *Hook. Spec. Filic.* iv. 180, *Syn. Filic.* 331.—Fronds 2 to 4 in. long, coriaceous, deeply pinnatifid. Segments lanceolate almost reaching the rhachis, but dilated and shortly confluent at the base, the larger ones in the middle of the frond 3 to 5 lines long, the lower ones shorter and broader, contracted into a short narrowly winged stipes. Veins pinnate in each lobe. Sori at the end of the veinlets, orbicular, 3 to 5 pairs in each lobe, forming 2 rows nearer to the margin than to the midrib.—*Grammitis blechnoides*, Grev. in Ann. Nat. Hist. ser. 2, i. 328, t. 17; *Polypodium contiguum*, Brackenr.; F. Muell. Fragm. v. 127.

Queensland. Rockingham Bay, *Dallachy.*

Also in the Pacific Islands.

4. **P. grammitidis,** *R. Br. Prod.* 147.—Fronds mostly 4 to 8 in. high, coriaceous, once or twice pinnatifid. Primary segments linear or narrow-lanceolate, reaching almost to the rhachis but more or less decurrent and confluent, the longer ones in the middle of the frond 1 to 1½ in. long, pinnatifid with the lobes mostly very short and obtuse but occasionally some of them linear and 3 to 4 lines long, the lower primary segments often shortly linear and entire, the lowest decurrent on the stipes, rarely almost all the segments linear and entire. Veins pinnate in the linear segments, almost simple in the short lobes. Sori orbicular or oval, varying from 1 to 4 according to the length of the lobe.—Hook. Spec. Filic. iv. 230, Syn. Filic. 327; Hook. f. Fl. Tasm. ii. 150; *Grammitis heterophylla,* Labill. Pl. Nov. Holl. ii. 90, t. 239; *Xiphopteris heterophylla,* Spreng Syst. iv. 44.

Victoria. Ferntree Gullies, Dandenong Range, *F. Mueller.*
Tasmania. Derwent River, *R. Brown*; abundant on alpine rocks forming matted patches, *J. D. Hooker.*

Also in New Zealand.

5. **P. tenellum,** *Forst.*; *Hook. Spec. Filic.* iv. 217, *Syn. Filic.* 337.—Fronds usually 1 to 2 ft. long, glabrous, simply pinnate, the stipes articulate on the rhizome. Pinnæ shortly petiolate and articulate on the rhachis, lanceolate, acuminate, often falcate, undulate-crenate, unequal at the base, 2 to 4 in. long, membranous. Veins pinnate with forked branches, one fork bearing the sorus, the other again forked. Sori orbicular, small, not very close, forming a row very near the margin as in the section *Nephrolepis* of *Aspidium.*—R. Br. Prod. 147; *Arthropteris tenella,* J. Sm. in Hook. f. Fl. N. Zel. t. 82.

Queensland. Brisbane River, Moreton Bay, *F. Mueller, A. Cunningham* and others; Mount Dryander, *Fitzalan.*
N. S. Wales. Grose River, *R. Brown*; Blue Mountains, *Mrs. Calvert*; New England, *C. Stuart*; Clarence, Macleay, Hastings and Richmond Rivers, *Beckler, Fawcett, Henderson* and others; Illawarra, *A. Cunningham* and others; Lord Howe's Island, *M'Gillivray, Milne, C. Moore.*

Also in New Zealand, Norfolk Island and New Caledonia.

6. **P. punctatum,** *Thunb. Fl. Jap.* 337.—Fronds 1 to 4 ft. long on a stipes of 1 ft. or more, broad in outline, twice or thrice pinnate as in the section *Lastrea* of *Aspidium.* Pinnules oblong, ½ to 1½ in. long, membranous or rather rigid when in full fruit, deeply pinnatifid with dentate segments. Veins in each pinnule or segment pinnate with free forked branches. Sori orbicular, in 2 rows on the smaller pinnules or longer lobes.—Hook. and Bak. Syn. Filic. 312; *P. rugosulum,* Labill. Pl. Nov. Holl. ii. 92, t. 241; R. Br. Prod. 147; Sieb. Syn. Filic. n. 109; F. Muell. Fragm. v. 129; *P. rugulosum,* Hook. Spec. Filic. iv. 272; Hook. f. Fl. Tasm. ii. 149; Bedd. Ferns S. India, t. 170.

Queensland. Rockingham Bay, *Dallachy*; Daintree River, *Fitzalan*; Brisbane River, Moreton Bay, *F. Mueller*; South Queensland, *Hartmann.*

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *A. Cunningham* and others; New England, *C. Stuart*; Richmond and Clarence Rivers, *W. Hill* and others; Illawarra, *Johnson*; Lord Howe's Island, *Fullagar.*

Victoria. Grampians, Dandenong Ranges, Bunip Creek, Upper Loddon River, etc., *F. Mueller* and others.

Tasmania. King's Island, *R. Brown*; abundant in damp and rather dry woods, *J. D. Hooker.*

Extends over the tropical and southern extratropical regions of the Old World, reaching northwards to Japan. It requires some care to distinguish the specimens from those of *Hypolepis tenuifolia* especially when the fructification is old, but the position of the sori on a nerve at some distance from the margin, is very different from that of *Hypolepis*, where it is strictly marginal with the recurved indusium very distinct when young.

SERIES II. SYNNEURA.—Veins pinnate under each lobe of the pinnæ, the branches simple, uniting with corresponding branches of the vein of the adjoining lobe. Sori usually placed towards the end of the upper branches of the series.

7. **P. proliferum**, *Presl; Hook. Spec. Filic.* v. 13, *Syn. Filic.* 315.—Fronds usually weak and spreading and often proliferous at the end, 1 to 2 ft. long when full grown, but some in full fruit much smaller, pinnate. Pinnæ lanceolate, 1 to 4 in. long in Australian specimens, shortly and regularly pinnatifid with obtuse rounded lobes sometimes almost reduced to crenatures, broadly truncate at the base. Veins pinnate to each lobe, the branches or veinlets of adjoining lobes uniting in a vein leading to the sinus as in the section *Nephrodium* of *Aspidium.* Sori in 2 rows to each lobe, sometimes only at the end sometimes reaching almost to the midrib of the pinnæ.—F. Muell. Fragm. v. 128; *Meniscium proliferum*, Hook. 2nd Cent. Ferns, t. 15; *Goniopteris prolifera*, Presl; Bail. Queensl. Ferns, 40.

N. Australia. Albert River, *Landsborough.*

Queensland. Mount Mueller, Rockingham Bay, *Dallachy*; Mount Elliott and Port Denison, *Fitzalan*; Palmer River, *Hahn's Expedition*; Rockhampton *O'Shanesy*; Brisbane River, *W. Hill.*

N. S. Wales. Clarence River, *Herb. F. Mueller.*

Dispersed over tropical Asia and Africa and in New Caledonia.

8. **P. urophyllum**, *Wall.; Hook. Spec. Filic.* v. 9, *Syn. Filic.* 314. —Fronds 2 to 4 ft. long on a stipes often nearly as long, pinnate, more or less glandular-pubescent underneath. Pinnæ 6 in. to nearly 1 ft. long, 1 to 2 in. broad, acuminate, regularly and broadly crenate or shortly lobed, rounded or truncate at the base. Primary veins leading to the lobes numerous and parallel, pinnate, the branches or venules uniting in an intermediate vein leading to the sinus. Sori orbicular in 2 regular rows between each 2 primary veins, extending from the mid-

rib of the pinnæ to the margin.—*Goniopteris urophylla*, Presl; Bail. Queensl. Ferns, 39; *G. lineata*, Bedd. Ferns Brit. Ind. t. 3; *Meniscium* or *Polypodium Kennedyi*, F. Muell. Fragm. iv. 165; *Goniopteris Kennedyi*, F. Muell.; Bail. Queensl. Ferns, 41.

Queensland. Rockingham Bay, *W. Hill, Dallachy*; Daintree River, *Fitzalan*; York Peninsula, *N. Taylor.*

Spread over tropical Asia and the Pacific Islands. The figure of *Meniscium cuspidatum*, Blume, Fl. Jav. Filic. t. 45, quoted for this species is a good representation of the form and venation, but with very differently shaped sori.

9. **P. Hillii,** *Bak. Syn. Filic.* 505.—Frond in the specimen seen 1¼ ft. high including the stipes, pinnate, densely and softly hirsute all over. Pinnæ 9, the 3 terminal ones (exceptionally) small, the others oblong, 4 to 6 in. long, 1½ to 2 in. broad, pinnately crenate or shortly lobed but less regularly so than in the preceding species. Parallel primary pinnate veins leading to the lobes, the branches or venules uniting in an intermediate vein reaching the sinus. Sori as in *P. urophyllum*, in 2 rows between each 2 primary veins, reaching from the midrib to the margin but not close.—*Goniopteris Ghiesbrechtii*, Bail. Queensl. Ferns, 40, not of *Linden.*

Queensland. Between Cleveland and Rockingham Bay, *W. Hill.*

10. **P. pœcilophlebium,** *Hook. Spec. Filic.* v. 14, *Syn. Filic.* 314.—Fronds usually about 1 ft. long on a stipes at least half as long, pinnate, glabrous. Pinnæ lanceolate, acuminate, 4 to 8 in. long, 1 to 1½ in. broad, shortly contracted into a petiole. Primary parallel veins numerous and prominent, pinnate, the branches or veinlets oblique, more or less anastomosing with those of the adjoining primary vein, but not forming a straight intermediate vein as in the preceding species. Sori rather small, in two irregular rows between each 2 primary veins.—*Goniopteris pœcilophlebia*, Bail. Queensl. Ferns, 40.

Queensland. Endeavour River and Fitzroy Island, *A. Cunningham*; Dunk Island, *M'Gillivray*; Rockingham Bay, *W. Hill, Dallachy*; Mount Elliott, Daintree River and Port Denison, *Fitzalan*; York Peninsula, *N. Taylor.*

SERIES III. DICTYOPHLEBIA.—Venation reticulate. Primary veins proceeding from the midrib more or less distinctly parallel, connected by transverse anastomosing veinlets enclosing areoles in some of which are short free usually clavate veinlets. Sori placed either on the free veinlets or on the connecting branches.

In the coriaceous species the venation is generally concealed and the free veinlets difficult to observe, in some others they are only in a very few of the areoles, but I have always found them in all the Australian species of the series. The position of the sori at the end of a free veinlet or in the middle of a connecting one is not constant in the same species or in the same frond, but in the whole genus they are never on the primary veins.

11. **P. serpens**, *Forst.*; *Hook. and Bak. Syn. Filic.* 349.—Fronds small but growing in large matted patches, entire, coriaceous, obtuse, contracted into a short or rather long stipes, densely covered on the lower surface and more loosely on the upper one with stellate hairs or scales, the barren ones obovate or oblong, from under ½ in. to 1½ in. long, the fertile ones linear or oblong-linear, ¾ to 1 in. long. Venation reticulate, concealed in the thick texture of the frond, and the dry frond even rugose with indented lines not connected with the veins. Sori irregularly crowded in the upper end or nearly over the whole frond, often confluent when old.—Sieb. Syn. Filic. n. 95; F. Muell. Fragm. v. 129; *P. rupestre*, R. Br. Prod. 146; Hook. Spec. Filic. v. 46; *Niphobolus rupestris*, Kaulf.; Hook. and Grev. Ic. Filic. t. 98; *Polypodium confluens*, Hook. Spec. Filic. v. 46, Syn. Filic. 349, not of R. Br.; *Niphobolus confluens*, Bail. Queensl. Ferns, 43.

Queensland. Edgecombe and Rockingham Bay, *Dallachy*; Mount Elliott, *Fitzalan*; Brisbane River, Moreton Bay, *A. Cunningham*, *F. Mueller* and others; Rockhampton, *Thozet*.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Woolls* and others; New England, *C. Stuart*; Hastings River, *Fraser*; Clarence River, *Beckler*, *Wilcox*; Tweed River, *Guilfoyle*; Illawarra, *Johnson*; Twofold Bay, *L. Morton*.

Victoria. Cabbage-tree and Broadribb Rivers, *F. Mueller*; Cape Howe, *Walter*.

Also in New Zealand and the South Pacific Islands.

12. **P. confluens**, *R. Br. Prod.* 146.—Fronds entire, coriaceous, obtuse or rarely acuminate, contracted into the stipes, covered with stellate hairs or scales usually very small and often deciduous making the fronds appear glabrous, but sometimes almost as abundant as in *P. serpens*, the barren ones oblong or obovate-oblong, 1 to 2 in. long, the fertile ones linear or lanceolate varying from 3 or 4 in. to nearly 1 ft. long. Veins reticulate but concealed in the texture as in *P. serpens*. Sori large, oval or oblong, in a single row on each side of the midrib, often confluent when old.—*P. glabrum*, Metten. Polypod. 123, Hook. and Bak. Syn. Filic. 356; *P. acrostichoides*, Sieb. Syn. Filic. 94, not of Forst.

Queensland. Burnett River, *F. Mueller*; Brisbane River, Moreton Bay, *A. Cunningham*, *F. Mueller*; Rockhampton, *Bowman*, *O'Shanesy*, *Thozet*.

N. S. Wales. Hunter's and Paterson's Rivers, *R. Brown*; New England, *C. Stuart*; Hastings, Macleay and Clarence Rivers, *Beckler*; Lord Howe's Island, *C. Moore*, *Fullagar*.

Also in Norfolk Island and New Caledonia. Included by F. Mueller, Fragm. v. 129, in *P. serpens* and originally referred by Hooker and Baker to the nearly allied Asiatic *P. angustatum*, Sw. (*Niphobolus angustatus*, Hook. Gard. Ferns, t. 20).

13. **P. acrostichoides**, *Forst.*; *Hook. and Bak. Syn. Filic.* 350. —Fronds lanceolate, entire or rarely forked at the apex, 6 in. to 2 ft.

long, contracted into a short stipes, coriaceous with the concealed reticulate venation of *P. serpens*, but the stellate hairs or scales on the under surface very minute and the upper surface usually glabrous. Sori in the upper part of the frond distinct but very small and exceedingly numerous crowded in several rows between the midrib and the margin.—R. Br. Prod. 146; *Niphobolus acrostichoides*, Bedd. Ferns Brit. Ind. t. 81; *N. puberulus*, Blume, Fl. Jav. Filic. 57, t. 23.

Queensland. Endeavour River, *Banks and Solander*; Cape York, *W. Hill*, *Daemel*; Cape York Peninsula, *N. Taylor*; Rockingham Bay, *W. Hill*, *Dallachy*; Fitzroy Island, *A. Cunningham*, *Walter*; Daintree River, *Fitzalan*.

Also in Ceylon, the Malayan Archipelago and the Pacific Islands.

14. **P. attenuatum,** *R. Br. Prod.* 146.—Fronds entire, coriaceous, linear-lanceolate, obtuse or shortly acuminate, 6 to 18 in. long, ¼ to ½ in. broad, contracted into a short stipes, glabrous, the reticulate venation concealed in the thick texture. Sori large, oval-oblong, inserted in cavities forming protuberances on the upper surface, rather distant in a single row on each side of the midrib about halfway between it and the margin.—Hook. Spec. Filic. v. 58, Gard. Ferns, t. 30; Sieb. Spec. Filic. n. 93, Fl. Mixt. n. 237; *Dictyopteris attenuata*, Presl; Bail. Queensl. Ferns, 41; *Polypodium Brownianum*, Spreng. Syst. v. 554 (Index); F. Muell. Fragm. v. 128; *P. Brownii*, Desv. in Ann. Soc. Linn. Par. vi. 227; Hook. and Bak. Syn. Filic. 355.

Queensland. Rockingham Bay, *Dallachy*; Mount Lindsay, *W. Hill*.
N. S. Wales. Port Jackson, *R. Brown*, *Fraser*, *A. Cunningham*; New England, *C. Stuart*; Newcastle, *Leichhardt*; Macleay, Clarence and Hastings Rivers, *Beckler*.

Brown's name was rejected on account of the *P. attenuatum* Humb. and Bonpl. published by Willdenow the same year (1810), but that species has been correctly referred by Grisebach to the *P. neriifolium*, Swartz, and the name *attenuatum* may therefore be retained for Brown's plant.

Also in the South Pacific Islands.

15. **P. simplicissimum,** *F. Muell. in Hook. and Bak. Syn. Filic.* 513.—Fronds lanceolate, acuminate, entire or slightly crenate, 4 to 10 in. long, tapering into a short stipes, rather thin, glabrous, prominently penniveined with intermediate reticulations and free veinlets in the areoles. Sori rather large, orbicular, in a single row on each side of the midrib halfway between it and the margin, the receptacle scarcely excavated and obscurely or not at all prominent on the upper surface.—*P. lanceola*, F. Muell. Fragm. vii. 120; *Pleopeltis lanceola*, Bail. Queensl. Ferns, 45.

Queensland. Rockingham Bay, *Dallachy*. Very closely allied to *P. lanceola*, Metten. in Ann. Sc. Nat. ser. 4, xv. 78, from New Caledonia to which F. Mueller refers it, but Kuhn who has compared it with the original specimen, writes that it differs in the much thinner texture of the frond and in the narrow scales of the rhizome. The latter character is however very uncertain in *Polypodium*, where the scales always appear much narrower on vigorous ends of the rhizome than on older portions when the points have become much worn down.

16. **P. nigrescens,** *Blume, Fl. Jav. Filic.* 161, *t.* 70.—Fronds 2 or 3 ft. long on a stipes of 1 ft. or more, glabrous, deeply pinnatifid. Pinnæ lanceolate, acuminate with a narrow point, membranous, 6 in. to 1 ft. long, 1 to 1½ in. broad, confluent at the base in a broad wing to the rhachis, the main veins very distinct, reticulate between them with numerous free veinlets in the areoles. Sori large in the centre of the larger areoles, distant in a single row on each side of the midrib at some distance from it, the receptacles deeply excavated and very prominent on the upper surface.—Hook. Spec. Filic. v. 81, Syn. Filic. 364.

Queensland. Daintree River, *Fitzalan.*

Spread over East India, the Malayan Peninsula and Pacific Islands.

P. membranifolium, R. Br. Prod. 147, from Endeavour River, *Banks and Solander*, is most probably, from the short diagnosis and the station, the same as *P. nigrescens*, Blume, and if that were proved, Brown's name has the right of priority, but unfortunately the original specimen cannot now be found in the Banksian herbarium.

17. **P. phymatodes,** *Linn.; Hook. Spec. Filic.* v. 82, *Syn. Filic.* 364.—Fronds 1, 2 or even 3 ft. long, deeply pinnatifid, very smooth and glabrous. Pinnæ lanceolate, 4 to 8 in. long, ¾ to 1½ in. broad, confluent at the base into a broadly winged rhachis, the midrib of each pinna very prominent, with copious reticulations between the primary veins but all concealed in the smooth though not thick texture of the frond. Sori rather large, orbicular or oval, distant in about two rows or rarely in a single row on each side of the midrib at some distance from it, the receptacles slightly excavated and prominent on the upper surface.—*Pleopeltis phymatodes*, T. Moore; Bail. Queensl. Ferns, 44; Bedd. Ferns S. Ind. t. 173.

Queensland. Cape York, *Daemel;* Rockingham Bay, *Dallachy;* Daintree River, *Fitzalan.*

Widely spread over the tropical regions of the Old World.

18. **P. pustulatum,** *Forst.; Carruth. in Seem. Fl. Vit.* 369, *not of Schkuhr.*—Near *P. phymatodes* but a smaller and more hardy plant. Fronds usually deeply pinnatifid, ½ to 1½ ft. high, with few segments but sometimes entire and 4 to 8 in. long. Segments oblong-lanceolate mostly acuminate, 3 to 6 in. long, 4 to 8 lines broad, confluent at the base into a broad-winged rhachis, of a firm membranous texture showing on the under side the primary veins with copious intermediate reticulations and free veinlets in the areoles. Sori orbicular, rather large, distant, in a single row on each side of the midrib at a distance

from it and often near the margin. Receptacles excavated, more or less prominent on the upper surface.—*P. scandens*, Labill. Pl. Nov. Holl. ii. 91, t. 240; F. Muell. Fragm. v. 128, not of Forst.; *P. Billardieri*, R. Br. Prod. 147; Hook. Spec. Filic. v. 82, Syn. Filic. 364; Sieb. Syn. Filic. n. 98; *P. diversifolium*, Willd.; Sieb. Fl. Mixt. n. 238; *Phymatodes Billardieri*, Presl; Hook. f. Fl. Tasm. ii. 150.

N. S. Wales. Port Jackson to the Blue Mountains, *R. Brown*, *Fraser*, *Woolls*; Clarence River, *Wilcox*; Macleay River, *C. Moore*; Tweed River, *Guilfoyle*; Illawarra and Twofold Bay, *F. Mueller*; Lord Howe's Island, *M'Gillivray*, *C. Moore*, *Fullagar*.

Victoria. Grampians, *Wilhelmi*, *Sullivan*; Dandenong Ranges, Apollo Bay and Cape Howe, *F. Mueller*.

Tasmania. Port Dalrymple and Kent's Island, *R. Brown*; abundant on rocks and trunks of trees, *J. D. Hooker*; King's Island, *Neate*.

Also in New Zealand and perhaps in New Caledonia.

19. **P. scandens,** *Forst. Prod.* 81, *not of Labill.*—Fronds much narrower in outline than in the preceding species, usually deeply pinnatifid and ½ to 1½ ft. long, but occasionally smaller and entire. Segments usually rather numerous, narrow lanceolate or almost linear, often falcate, obtuse or acuminate, 1½ to 3 in. long, decurrent and confluent into a winged rhachis, of a thinner texture than the preceding species although the veins are but little prominent. Sori rather small, distant, in a single row on each side of the midrib between it and the margin, the excavated receptacles slightly prominent on the upper surface.—*P. pustulatum*, Schkuhr, Filic. ii. t. 10, Hook. Spec. Filic. v. 80, Syn. Filic. 363, Sieb. Syn. Filic. n. 96, not of Forst.; *Pleopeltis pustulata*, T. Moore; Bail. Queensl. Ferns, 45.

Queensland. Brisbane River, Moreton Bay, *A. Cunningham*.

N. S. Wales. Port Jackson to the Blue Mountains, *Woolls* and others; New England, *C. Stuart*; Hastings River, *A. Cunningham*, *Beckler*; Macleay River, *Heriot*, *Fitzgerald*; Illawarra, *A. Cunningham*.

Victoria. Gillibrand River and Nangatta Mountains, *F. Mueller*.

Also in New Zealand and the South Pacific Islands.

20. **P. verrucosum,** *Wall.*; *Hook. Spec. Filic.* v. 31, *Gard. Ferns, t.* 41, *Syn. Filic.* 344.—Fronds 3 or 4 ft. long, pinnate, glabrous. Pinnæ oblong-lanceolate, acuminate, obtusely serrulate, equally or unequally cuneate at the base, shortly petiolate or almost sessile, apparently articulate on the rhachis, 6 to 8 in. long, ¾ to 1 in. broad, membranous. Venation reticulate between the primary veins with free venules in the areoles. Sori distant in a single row on each side of the midrib and near to it, the excavated receptacles very prominent on the upper surface.—*Goniophlebium verrucosum*, Bedd. Ferns Brit. Ind. t. 257.

Queensland. Rockingham Bay, *Dallachy*; Daintree River, *Fitzalan*.

Also in the Malayan Peninsula and Archipelago.

21. **P. subauriculatum,** *Blume, Fl. Jav. Filic.* 177, *t.* 83.—Fronds 1 to 3 ft. long, glabrous, pinnate. Pinnæ linear-lanceolate, mostly acuminate, entire or serrulate, 3 to 6 in. long, 3 to 5 lines broad, truncate rounded or auriculate at the base, nearly sessile but somewhat articulate on the rhachis. Venation reticulate between the primary veins, with free veinlets in the areoles. Sori distant in a single row on each side of the midrib and near to it, the excavated receptacles very prominent on the upper surface.—Hook. Sp. Filic. v. 32, Syn. Filic. 344; *Goniophlebium subauriculatum*, Presl; Bail. Queensl. Ferns, 42.

Queensland. Endeavour River, *A. Cunningham;* York Peninsula, *N. Taylor;* Rockingham Bay, *Dallachy;* Daintree River, *Fitzalan;* near Rockhampton, *O'Shanesy, Thozet.*

Spreads over tropical Asia and the Pacific Islands.

22. **P. rigidulum,** *Swartz; Hook. and Bak. Syn. Filic.* 368.—Fronds of 2 kinds. Fertile ones 2 to 4 ft. long, pinnate, glabrous or the rhachis slightly pubescent. Pinnæ narrow-lanceolate, usually rigid and very prominently and copiously reticulate, 3 to 9 in. long, 3 to 9 lines broad, obliquely or equally cuneate at the base, often shortly petiolate, articulate on the rhachis. Sori orbicular, distant in a single row on each side of the midrib and not far from it, the excavated receptacles prominent on the upper surface. Barren fronds sessile on the rhizome, ovate or oblong, 6 in. to 1 ft. long, 3 or 4 in. broad, shortly pinnatifid rigid and very prominently veined; the lower pinnæ of the fertile fronds are also occasionally barren and a little altered in shape or texture.—*P. diversifolium*, R. Br. Prod. 147; Hook. Spec. Filic. v. 98, Gard. Ferns, t. 5; F. Muell. Fragm. v. 127; *Drynaria diversifolia*, J. Sm.; Bail. Queensl. Ferns, 46; *Polypodium Gaudichaudii*, Blume, Fl. Jav. Filic. t. 67.

Queensland. Sandy Cape, Hervey Bay, *R. Brown;* Port Bowen, *A. Cunningham;* Port Denison and Mount Elliott, *Fitzalan;* Rockingham Bay, *W. Hill, Dallachy;* Rockhampton, *Bowman, Dallachy, O'Shanesy;* Fitzroy Island, *Walter;* Brisbane River, Moreton Bay, *Fraser, W. Hill, F. Mueller.*

N. S. Wales. Blue Mountains, *Mrs. Calvert.*

Also in the Malayan Archipelago and Pacific Islands. The great difference between the barren and fertile fronds in this and in *P. quercifolia*, upon which the genus *Drynaria* was founded appears to be a character of little real importance, as there are other cases where dissimilar and similar barren and fertile fronds occur in species otherwise very nearly allied.

23. **P. irioides,** *Poir.; Hook. Sp. Filic.* v. 67, *Syn. Filic.* 360.—Fronds entire, 1 to 3 ft. long, 1 to 3 in. broad, coriaceous, contracted into a very short stipes. Primary parallel veins distant and usually conspicuous, with copious fine reticulations between them, the free veinlets in the areoles numerous. Sori very small and numerous, covering the whole under surface of the upper part of the frond but quite distinct from each other.—Hook. and Grev. Ic. Filic. t. 125;

Blume, Fl. Jav. Filic. t. 77; *Pleopeltis irioides*, T. Moore; Bedd. Ferns S. Ind. t. 178.

Queensland. Shoalwater and Keppel Bays and Broad Sound, *R. Brown;* Cape York, *W. Hill, Gulliver;* Rockingham Bay, *Dallachy* (some of his specimens with rather larger sori); Rockhampton, *Bowman, Dallachy, O'Shanesy*; Moreton Bay. *F. Mueller, Bailey.*

Spreads over tropical and subtropical Asia and Africa and the Pacific Islands.

24. **P. quercifolium,** *Linn.; Hook. Spec. Filic.* v. 96, *Syn. Filic.* 367.—Fronds of two kinds. Fertile ones 2 to 3 ft. long, deeply pinnatifid; segments lanceolate, 6 to 9 in. long, ¾ to 1½ in. broad, decurrent on the rhachis and usually confluent into a broad wing but sometimes interrupted between the lower segments, thin but usually rigid, very prominently and copiously reticulate, but the free veinlets within the areoles small and rare. Sori small, scattered, few or numerous. Barren fronds sessile, short broad and shortly pinnatifid as in *P. rigidulum.*—*P. Linnæi*, Bory, Hook. and Bak. Syn. Filic. 368; Bedd. Ferns Brit. Ind. t. 315; *Drynaria quercifolia*, J. Sm.; Bedd. Ferns, S. Ind. t. 187; *D. Linnæi*, Bail. Queensl. Ferns, 46.

N. Australia. Coen River and islands of the Gulf of Carpentaria, *R. Brown;* Port Darwin, *Schultz, n.* 2, 17, 674; North Coast, *Gulliver.*

Queensland. Keppel Bay, *R. Brown;* Albany Island, *F. Mueller;* Cape York, *Daemel;* Endeavour River, *A. Cunningham;* York Peninsula, *N. Taylor;* Rockingham Bay, *Dallachy;* Rockhampton, *Bowman;* Fitzroy Island, *Walter.*

Spread over East India the Malayan Peninsula and Pacific Islands.

P. aureum, Linn.; Hook. Spec. Filic, v. 16, Syn. Filic. 347, a tropical American species unknown in the Old World, has been included by F. Mueller, Fragm. v. 128, on the authority of a specimen from Hastings River, *Beckler;* but there is probably here some mistake, the plant has been long in general cultivation in plant-houses. The species has deeply pinnatifid fronds not unlike the fertile ones of *P. quercifolium*, but less rigid and the venation is simply reticulate without singly free veinlets in the areoles, the sori in one or 2 irregular rows on each side of the midrib are inserted at the junction of 2 veinlets in the areoles, and the receptacles are not prominent on the upper surface as in *P. phymatodes* which it also resembles in some respects.

34. NOTHOLÆNA, R. Br.

Rhizome tufted. Fronds usually small, once twice or thrice pinnate with small lobed segments. Veinlets forked from a central nerve or from the base of the segment. Sori small at the ends of the veinlets, almost contiguous forming an apparently continuous line within the unaltered margin, which is however more or less curved over them in a young state.

A small genus ranging over the tropical and warmer temperate regions of the New and the Old World. Of the four Australian species, one is identical with a West Mediterranean one, another extends to New Zealand and New Caledonia, the two remaining ones appear to be endemic. The genus is closely allied to *Cheilan-*

thus, with which it is united by F. Mueller and some others, but the recurved margins of the fronds can scarcely be regarded as true indusia. Some modern purists have altered Brown's name to *Nothochlæna*, but the contraction of χλαινα into *Læna*, after the example of the Romans, has been too generally sanctioned by botanists in many other cases, such as *Diplolæna*, *Eriolæna*, *Microlæna*, etc., to be here rejected.

Fronds 1 to 3 in. high, with few membranous and glabrous undivided or 3-lobed pinnæ . . . . 1. *N. pumilio.*
Fronds lanceolate in outline, 3 to 10 in. high, once or twice pinnate with pinnatifid pinnæ.
  Pinnæ densely covered underneath with more or less woolly scales . . . . 2. *N. vellea.*
  Pinnæ densely covered underneath with bristly scales . 3. *N. distans.*
Fronds broadly deltoid in outline, under 6 in. high, twice or thrice pinnate, sprinkled with rigid bristle-like hairs . . . . 4. *N. fragilis.*

1. **N. pumilio,** *R. Br. Prod.* 146.—Fronds tufted, 1 to 3 in. high, simply pinnate, with a filiform rhachis. Pinnæ few, ovate or oblong, obtuse, 3 to 5 lines long, membranous, without scales, entire or the lower ones with a short lateral lobe on one or both sides, the upper ones confluent. Veins obliquely diverging from the midrib. Sori continuous round the margin except at the base, the margin of the frond at first turned over them, but afterwards flat and not altered in consistence.—F. Muell. Fragm. viii. 175; *N. paucijuga*, Bak. Syn. Filic. 515.

N. Australia. Port Darwin, *Schultz*, *n.* 62.
Queensland. Endeavour River, *Banks and Solander*, *N. Taylor*.

2. **N. vellea,** *R. Br. Prod.* 146.—Fronds tufted, mostly under 6 in. long but in a few specimens 9 or 10 in., oblong-lanceolate in outline, pinnate or bipinnate, the rhachis hirsute. Pinnæ ½ to 1 in. long, deeply pinnatifid or pinnate, rather thick, green and hispid above, very densely woolly hirsute and often ferruginous underneath, the lobes or segments ovate or rounded, very obtuse. Sori at the ends of the forked veins forming an almost continuous narrow line round the margin.—*Acrostichum velleum*, Ait.; *A. lanuginosum*, Desf. Fl. Atl. ii. 400, t. 256; *Notholæna lanuginosa*, Poir. Dict.-Suppl. iv. 110; Hook. Spec. Filic. v. 119, Syn. Filic. 370; *N. Brownei*, Desv. in Mem. Soc. Linn. Par. vi. 220; *Gymnogramme Brownei*, Kuhn in Bot. Zeit. 1869, 458; *Notholæna lasiopteris*, F. Muell. in Hook. Kew Journ. v. 106; *Cheilanthes vellea*, F. Muell. Fragm. v. 123.

N. Australia. Arnhem S. Bay, *R. Brown*; Upper Victoria River and Sea Range, *F. Mueller*; Arnhem Land, *M'Kinlay*; Port Darwin, *Schultz*, *n.* 954.

Queensland. Cape York, *Daemel*; Cleveland and Rockingham Bays, *W. Hill*, *Dallachy*, *Gulliver*; Gilbert River, *Daintree*; Suttor River, *Bowman*.

N. S. Wales. In the interior from the Lachlan and Darling to the Barrier Range, *Victorian Expedition* and many others.

S. Australia. Lake Torrens, *F. Mueller*; Gawler Range, *Sullivan*; Lake Eyre, *Andrews*; Macdonnell Range, *Giles*.

W. Australia. Fraser's Range, *Dempster*.

Also in the West Mediterranean region. The distinctions pointed out by Kuhn between the Mediterranean and Australian plant do not hold good in all the Australian specimens.

3. **N. distans,** *R. Br. Prod.* 146.—Very closely allied to *N. vellea*, of the same stature and general habit and not always easy to distinguish from it. The outline of the frond generally narrower, the lobes of the pinnules smaller and the indumentum not so dense, assuming on the under surface the form of bristles with little or none of the woolly hairs of *N. vellea.* Sori the same.—Hook. Spec. Filic. v. 114, Ic. Pl. t. 980, Syn. Filic. 372; Kunze in Pl. Preiss. ii. 109; *Cheilanthes distans*, A. Braun; F. Muell. Fragm. v. 122.

Queensland. Percy Islands, *A. Cunningham;* Logan River, *Fraser;* Brisbane River, *F. Mueller*, and many other localities in South Queensland from various collectors.

N. S. Wales. Port Jackson, *R. Brown, A. Cunningham, Woolls;* New England. *C. Stuart;* Lord Howe's Island, *Fullagar.*

Victoria. Snowy River, *F. Mueller.*

S. Australia. Spencer's Gulf, *R. Brown;* Lofty Ranges, *F. Mueller;* Gawler Range, *Giles.*

W. Australia, *Drummond, n.* 666; York District, *Preiss, n.* 1302.

Also in Norfolk Island, New Caledonia and New Zealand. It is referred by Mettenius, Filic. Hort. Lips. 51 to the S. African *Cheilanthes profusa*, Kunze.

4. **N. fragilis,** *Hook. Spec. Filic.* v. 114, t. 287, *Syn. Filic.* 372.—Rhizome horizontal, rather thick, scaly. Fronds broadly deltoid in outline, in some specimens 1 to 1½ in. long, on a slender stipes twice as long, in others 3 in. long and broad, with a firmer black stipes twice or thrice as long, pinnate with numerous small deeply pinnatifid pinnules, the ultimate lobes under 1 line long, each one bearing a sorus large in proportion. Partial rhachis and under side of the lobes hispid with a few rigid hairs or bristles.—*Cheilanthes fragillima*, F. Muell. Fragm. v. 123.

N. Australia. Fitzmaurice River, *F. Mueller;* Port Darwin, *Schultz, n.* 110, 138, 211.

35. GRAMMITIS, Swartz.

(Gymnogramme, *Desv.*)

Rhizome short and tufted or creeping. Fronds pinnate or bipinnate, with forked and free or reticulate veins. Sori linear or oblong, without any indusium, on veins diverging from the midrib, scattered or crowded in a broad intramarginal line.

The genus is generally dispersed over the tropical and some temperate regions in both hemispheres, in the New and the Old World. Of the six Australian species, one is widely dispersed in the Old World without the tropics extending to the Andes of

America, another is known from New Zealand Chili and South West Europe, a third is only in the Malayan Archipelago and Pacific Islands, and three are endemic.

Fronds simply pinnate. Pinnæ thick, entire, scaly underneath, with free veins, the sori crowded in a broad marginal line or band.
  Pinnæ broadly ovate. Line of sori not 1 line broad . . 1. *G. Reynoldsii.*
  Pinnæ ovate or oblong. Line of sori above 1 line broad . 2. *G. Muelleri.*
Fronds small, bipinnate, with lobed segments. Veins free.
  Pinnæ covered underneath with scaly hairs . . . . . 3. *G. rutæfolia.*
  Pinnæ glabrous thin and delicate . . . . 4. *G. leptophylla.*
Fronds simply pinnate or pinnatifid with long lanceolate pinnæ or segments. Veins netted.
  Pinnæ tapering at the base, quite distinct. Sori very irregular and unequal . . . . 5. *G. pinnata.*
  Segments connected by a winged rhachis. Sori long, mostly reaching the margin . . . . 6. *G. ampla.*

(See also *Polypodium australe*, with small narrow coriaceous undivided fronds.)

1. **G. Reynoldsii,** *F. Muell.*—Rhizome unknown. Fronds in our specimens 3 so 6 in. long, simply pinnate. Pinnæ in distant pairs, broadly ovate or orbicular, obtuse, entire, about ¼ in. long, thick and densely covered on both sides with hairlike scales. Sori buried under the scales, oblong or shortly linear, transverse and distinct but closely crowded near the margin, forming a continuous line about 1 line broad, *Notholæna Reynoldsii*, F. Muell. Fragm. viii. 175.

Central Australia. Near Mount Olgar, *Gosse.* Evidently nearly allied to the following species.

2. **G. Muelleri,** *Hook.; F. Muell. Fragm.* v. 138.—Rhizome scaly, shortly creeping. Fronds 6 in. to 1 ft. long, simply pinnate, the rhachis scaly. Pinnæ in distant pairs, ovate or oblong, obtuse, entire, ½ to 1 in long, thick, sprinkled above and densely covered underneath with ciliate scales. Sori nearly buried under the scales, very numerous, mostly short, transverse but crowded in an apparently continuous line round the margin usually about 1½ lines broad. A few short barren outer fronds often with only 3 pinnæ or a single cordate one.—*Gymnogramme Muelleri*, Hook. Spec. Filic. v. 143, t. 295, Syn. Filic. 379.

Queensland. Cleveland and Rockingham Bays, *W. Hill, Bowman, N. Taylor;* Gilbert River, *Armit;* Rockhampton, *Bowman, O'Shanesy, Thozet.*

3. **G. rutæfolia,** *R. Br. Prod.* 146.—Fronds tufted, 3 to 6 in. long, pinnate. Pinnæ obliquely obovate or almost fan-shaped, 3 to 6 lines long and broad, toothed, lobed, or again somewhat pinnate, contracted into a short petiole, sprinkled above and more densely covered underneath as well as the rhachis with brown scaly hairs occasionally glandular. Veins forked and radiating. Sori linear, mostly about the

middle of the pinna, sometimes almost covering the surface.—F. Muell. Fragm. v. 137; *Gymnogramme rutæfolia*, Hook. Spec. Filic. v. 137, Ic. Pl. t. 935, Filic. Exot. t. 5; Hook. and Grev. Ic. Filic. t. 90; Kunze in Pl. Preiss. ii. 110; Hook. f. Fl. Tasm. ii. 151; *Gymnogramme Pozoi*, Kunze; Hook. and Bak. Syn. Filic. 379; *Gymnogramme subglandulosa*, Hook. and Grev. Ic. Filic. t. 91; *Gymnogramme papaverifolia*, Kunze; Bail. Queensl. Ferns, 34.

Queensland. Port Denison, *Fitzalan*; Dalrymple Creek, *Hartmann*; Springsure, *Wuth*; Maranoa River, *Mitchell*.
N. S. Wales. Port Jackson and Blue Mountains, *Woolls* and others; Liverpool Plains, *A. Cunningham*, *C. Moore*; New England, *C. Stuart*; Goyinga Mountains, *Victorian Expedition*.
Victoria. Melbourne, *Adamson*, *Robertson*; Grampians, *Sullivan*; Broken and Goulburn Rivers, *F. Mueller*; Gipps' Land, *Walter*.
Tasmania. Derwent River, *R. Brown*, common in shaded dry stony places, *J. D. Hooker*.
S. Australia. Lofty Range, *F. Mueller*; Gawler Range, *Sullivan*; Central Australia, *Gosse*, *Giles*.
W. Australia, *Drummond*, *n.* 1000; York District, *Preiss*, *n.* 1303; Stirling Range, *F. Mueller*; between Esperance Bay and Fraser's Range, *Dempster*.

Also in South Western Europe, Chili and New Zealand.

4. **G. leptophylla,** *Swartz, Filic.* 218, *t.* 1, f. 6.—Fronds tufted, delicate, under 6 in. high and often only 2 in., the outer ones short, with few broadly obovate or fan-shaped segments often barren, the others erect with a slender black rhachis, twice pinnate; segments numerous, oblong or cuneate, 2 to 3 lines long, more or less deeply lobed, with usually a single oblong sorus on each lobe, often covering the whole surface.—F. Muell. Fragm. v. 137; *Gymnogramme leptophylla*, Desv.; Hook. Spec. Filic. v. 136, Brit. Ferns, t. 1, Syn. Filic. 383; Hook. and Grev. Ic. Filic. t. 25; Hook. f. Fl. Tasm. ii. 151; Bedd. Ferns S. Ind. t. 270.

N. S. Wales. Port Stephen, *King*.
Victoria. Yarra and Loddon Rivers and neighbourhood, *F. Mueller*, *Robertson* and others.
Tasmania. Spring Bay near the Tamar, *Gunn*.
S. Australia. Barossa Range, *Behr*.
W. Australia, *Drummond*, *n.* 360, 996.

Widely dispersed over the temperate and subtropical regions of the Old World, and also in the Andes of South America.

5. **G. pinnata,** *F. Muell. Fragm.* vi. 124.—Rhizome shortly creeping. Fronds 1 to 2 ft. high, simply pinnate, glabrous. Pinnæ 3 to 11 or reduced to the single terminal one, lanceolate, 4 to 10 in. long, ½ to 1 in. broad, contracted at the base into a short petiole, entire, the prominent midrib and rhachis smooth and shining. Veins diverging from the midrib forked and anastomosing. Sori linear or narrow-oblong, very unequal and irregularly scattered.—*Gymnogramme pinnata*, Hook. Spec. Filic. v. 151, Syn. Filic. 390; *Hemionitis elongata*,

Brackenr. Filic. U. S. Expl. Exped. t. 8; *Dictyogramme pinnata*, T. Moore; Bail. Queensl. Ferns, 33.

Queensland. Rockingham Bay, *W. Hill*, *Dallachy*.

Also in the Malayan Archipelago and South Pacific Islands.

6. **G. ampla,** *F. Muell. Fragm.* v. 188.—Rhizome rather thick, scaly, creeping. Fronds 1 to 2 ft. high, deeply pinnatifid, glabrous. Segments 3 to 11, lanceolate, 3 to 6 in. long, ¾ to 1¼ in. broad when fertile, often 2 in. when barren, acuminate, membranous, entire, decurrent and connected by a broad wing to the rhachis, the wing gradually tapering below the lowest pair but continued almost to the base of the stipes. Veins proceeding from the midrib immediately forked, one branch bearing a straight linear sorus extending usually to the margin, the other prominent flexuose with anastomosing branches, and from both are emitted a few short free branches.

Queensland. Rockingham Bay, *Dallachy*; Daintree River, *Fitzalan*.

Included by Baker, Syn. Filic. 389–390 in the Asiatic *Gymnogramme* (*Grammitis*) *elliptica*, Bak. (*Polypodium*, Thunb.), but the further specimens in Herb. F. Mueller, have convinced him that it differs essentially in the thin membranous texture, the continuously winged rhachis and stipes, the longer sori, more prominent intermediate veins, etc.

36. ANTROPHYUM, Kaulf.

Rhizome creeping. Fronds simple, entire, lanceolate or broad, with longitudinal more or less anastomosing veins, bearing long linear sori without any indusium.

A small genus dispersed over the tropical regions of the New and the Old World. The only Australian species is Asiatic, extending to the Pacific Islands.

1. **A. reticulatum,** *Kaulf.*; *Hook. Spec. Filic.* v. 169; *Syn. Filic.* 393.—Rhizome hairy, creeping. Fronds 6 in. to 1 ft. long, 1 to 1½ in. or rarely nearly 2 in. broad, acuminate, tapering into a short stipes, glabrous, rather firm, the veins prominent on the upper surface forming long narrow areoles. Sori all longitudinal, narrow-linear but varying much in number and length.—Bedd. Ferns S. Ind. t. 52 and 231; *A. plantagineum*, Kaulf.; Bail. Queensl. Ferns, 33.

Queensland. Rockingham Bay, *W. Hill*, *Dallachy*; Bowen, *Woolls*; Daintree River, *Fitzalan*.

A. semicostatum, Blume, Fl. Jav. Filic. 77, t. 33, to which F. Mueller, Fragm. v 138, refers this plant, is a form or variety with a larger frond broader above the middle. The Australian specimens agree better with the typical *A. reticulatum* as figured by Schkuhr, Syn. Filic. t. 6.

37. ACROSTICHUM, Linn.

Rhizome creeping sometimes to a great length or short and erect. Fronds undivided or pinnate, variously veined. Sori confluent, covering the under surface of the fertile fronds or pinnæ, which are usually smaller or narrower than the barren ones. No indusium.

A large genus, chiefly tropical, spread over both the New and the Old World. Of the seven Australian species three are common to the New and the Old World, three limited to the Old World and one only endemic.

Fronds simple, lanceolate, with free veins, the fertile ones nearly similar . . . . 1. *A. conforme.*
Fronds pinnate. Pinnæ entire, the barren with numerous parallel free veins, the fertile very narrow-linear.
  Barren pinnæ broadly lanceolate, rounded or cuneate at the base . . . . 2. *A. scandens.*
  Barren pinnæ narrow-lanceolate, tapering to a petiole . 3. *A. sorbifolium.*
Fronds pinnate. Veins reticulate.
  Pinnæ membranous, shortly and broadly pinnatifid, the fertile usually on different fronds . . . . 4. *A. repandum.*
  Pinnæ coriaceous, entire, the upper ones fertile on the same fronds . . . . 5. *A. aureum.*
Fronds simple, narrow, with reticulate veins, contracted into a linear fertile apex . . . . 6. *A. spicatum.*
Fronds bipinnate, the fertile segments narrow-linear on different fronds from the barren . . . . 7. *A. pteroides.*

1. **A. conforme,** *Swartz; Hook. Spec. Filic.* v. 198, *Syn. Filic.* 401.—Rhizome creeping, scaly. Fronds simple, lanceolate, coriaceous, from a few in. to above 1 ft. long, $\frac{1}{2}$ to 1 in. broad, acute or acuminate, tapering into a stipes sometimes narrowly winged almost to the base; veins parallel, simple or forked, not close, and concealed in the texture of the frond. Fertile fronds usually smaller and more obtuse.—F. Muell. Fragm. v. 138; *Elaphoglossum conforme,* Schott; Bail. Queensl. Ferns, 9.

Queensland. Rockingham Bay, *Dallachy.*

Widely spread over the tropical and southern extratropical regions of the New and the Old World.

2. **A. scandens,** *J. Sm.; Hook. Spec. Filic.* v. 249, *Syn. Filic.* 412.—Rhizome woody, scaleless, creeping in swamps or climbing on trees. Fronds 1 to 3 ft. long, simply pinnate. Pinnæ of the barren fronds broadly lanceolate, acuminate, rounded or cuneate at the base and shortly petiolate, 3 to 8 in. long, $\frac{3}{4}$ to $1\frac{1}{2}$ in. broad, entire or slightly dentate, coriaceous, smooth and shining. Veins very numerous fine and closely parallel. Pinnæ of the fertile fronds long and very narrow-linear, sometimes almost terete, sometimes flat and 2 lines broad.—F. Muell. Fragm. vi. 124; *Stenochlæna scandens,* J. Sm.; Bail. Queensl. Ferns, 10.

N. Australia. Port Darwin, *Schultz, n.* 3, 215.
Queensland. Cape York, *W. Hill;* Rockingham Bay, *W. Hill, Dallachy.*
Also in Tropical Asia and the Pacific Islands.

3. **A. sorbifolium,** *Linn.; Hook. Spec. Filic.* v. 241, *Syn. Filic.* 412, *var.* leptocarpum.—Rhizome woody, often climbing trees to the height of 30 or 40 ft. Fronds pinnate, 1 to 2 ft. long. Pinnæ of the barren fronds lanceolate, acuminate, equally or obliquely tapering into a short petiole, 3 to 8 in. long, 4 to 8 lines broad, often denticulate, not very thick but smooth and shining. Veins numerous, parallel, ¾ to 1 line apart. Pinnæ of the barren fronds more numerous, almost filiform in the Australian specimens, ¼ in. broad or rather more in some exotic forms.—*A. Brightiæ,* F. Muell. Fragm. vii. 119; *Lomariopsis Brightiæ,* F. Muell. in Bail. Queensl. Ferns, 10.

Queensland. Rockingham Bay, *Dallachy.*

Spread over the tropical regions of the New and the Old World. Exceedingly variable as to the breadth of the fertile pinnæ, etc., and divided by Fée into seventeen species of a genus *Lomariopsis,* amongst which his *L. leptocarpa* and some others are well represented among Dallachy's specimens.

4. **A. repandum,** *Blume; Hook. Spec. Filic.* v. 260, *Syn. Filic.* 419.—Rhizome creeping. Fronds 1 to 2 ft. long, pinnate, the rhachis scaly. Pinnæ of the barren fronds membranous, lanceolate, the lower ones obliquely truncate at the base and attached by the midrib, 3 to 5 in. long, under 1 in. broad in the Australian specimens, pinnatifid with broad lobes rarely reaching halfway to the midrib, the upper pinnæ smaller more entire and confluent into a broad wing to the rhachis. Veins copiously reticulate, with a central vein opposite each lobe. Pinnæ of the fertile fronds much smaller and narrower, but usually more or less pinnately lobed or broadly crenate.—F. Muell. Fragm. v. 138.

Queensland. Rockingham Bay, *W. Hill, Dallachy;* Daintree River, *Fitzalan* (one of the specimens with a semi-fertile frond); Bowen, *Woolls;* York Peninsula, *N. Taylor* (young plants of a few inches already in fruit).

Extends over the Malayan Archipelago to South China and the Pacific Islands.

5. **A. aureum,** *Linn.; Hook. Spec. Filic.* v. 266, *Syn. Filic.* 423.—Rhizome short, thick, erect. Fronds 2 to 6 ft. long, pinnate, glabrous, the rhachis firm and smooth. Pinnæ distant, the lower ones petiolate, the upper sometimes shortly decurrent, coriaceous, entire, oblong, from 3 to 4 in. long, ¾ to 1½ in. broad, the fertile ones rather smaller, few or many in the upper part of the same fronds as the barren ones. Veins oblique, very fine and numerous, copiously reticulate.—Bedd. Ferns S. Ind. t. 204; *A. fraxinifolium,* R. Br. Prod. 145.

N. Australia. M'Adam Range, *F. Mueller;* Port Essington, *Armstrong;* Port Darwin, *Schultz, n.* 521.

Queensland. Port Bowen, *R. Brown, Woolls;* Cape York, *W. Hill, Daemel;* York Peninsula, *N. Taylor;* Endeavour River, *A. Cunningham;* Rockingham Bay, *Dallachy;* Daintree River, *Fitzalan;* Brisbane River, *A. Cunningham, F. Mueller.*

N. S. Wales. Clarence River, *Wilcox;* Richmond River, *Henderson, Mrs. Hodgkinson.*

Widely spread over the tropical and subtropical regions of the New and the Old World. In Australia chiefly in swampy flats or salt water marshes.

6. **A. spicatum,** *Linn.; Hook. Spec. Filic.* v. 280, *Syn. Filic.* 424.—Rhizome thick, creeping. Fronds simple, 6 to 18 in. long, the lower barren part lanceolate or linear-lanceolate, 3 to 9 lines broad, contracted at the top into a fertile linear apex 1 to 1½ lines broad, of variable length. Veins in the barren part obliquely reticulate with a free veinlet within the areoles. Sori in the fertile part forming a broad continuous line on each side of the midrib with the free margin recurved over them when young but at length covering the under surface. Spore-cases often intermixed with peltate scales.—*Hymenolepis spicata,* Presl; Hook. Filic. Exot. t. 78, Gard. Ferns, t. 3; Bedd. Ferns S. Ind. t. 46.

Queensland. Brisbane River, Moreton Bay, *W. Hill.*

Spread over tropical Asia, extending to the Mascarene and to the Pacific Islands.

7. **A. pteroides,** *R. Br. Prod.* 145.—Rhizome shortly creeping. Fertile fronds ovate-lanceolate in circumscription, 3 to 6 in. long on a stipes at least as long, bipinnate. Segments linear, ¾ to 1½ in. long, scarcely 1 line broad. Sori on very numerous diverging veins, at a little distance from the midrib, so close together as to cover the whole frond except the midrib and a very narrow margin recurved over the young sori. Barren fronds, which I have not seen, "smaller than the fertile ones with linear-lanceolate segments, otherwise similar" (*Kuhn*).—Hook. Spec. Filic. v. 279; F. Muell. Fragm. v. 139; *Neurosoria pteroides,* Metten.; Kuhn in Bot. Zeit. 1869, 438.

N. Australia. North Coast, *R. Brown;* Port Darwin, *Schultz, n.* 137; Gilbert River, *Armit.*
Queensland. Endeavour River, *G. Brown.*

38. PLATYCERIUM, Desv.

Rhizome short and thick. Fronds large, the outer ones of each year's growth barren and horizontally spreading, the fertile ones erect cuneate forked or dichotomous, the veins prominent radiating and reticulate. Sori forming very large broad patches towards the end of the fronds.

A small genus, sparingly distributed over the Malayan Archipelago and tropical Africa and America. Neither of the Australian species are endemic.

Sori covering the ultimate lobes of the fertile fronds . . . 1. *P. alcicorne.*
Sori forming a large patch under the broad sinus of the primary division of the fertile fronds . . . . 2. *P. grande.*

1. **P. alcicorne,** *Desv.; Hook. Spec. Filic.* v. 282, *Syn. Filic.* 425.—Barren fronds orbicular-cordate, cottony when young, 6 in. to 1 ft.

long and broad, rigid, the margin more or less sinuate or obtusely lobed. Fertile fronds attaining 2 to 3 ft., contracted into a distinct stipes, dilated upwards, once twice or thrice forked. Sori or patches of spore-cases occupying the whole or the greater part of the ultimate lobes.—*Acrostichum alcicorne*, Swartz; R. Br. Prod. 145; Bot. Reg. t. 262.

Queensland. Bellenden Ker Range, *W. Hill;* Moreton Bay, *F. Mueller;* Rockhampton, *Bowman*, *O'Shanesy*, *Thozet;* Springsure, *Wuth*.
N. S. Wales. Port Jackson, *R. Brown*, *Fraser* and many others; New England, *C. Stuart;* Hastings River, *Beckler;* Illawarra, *Johnstone;* Lord Howe's Island, *Fullagar*.

Also in the Mascarene Islands.

2. **P. grande,** *J. Sm.; Hook. Spec. Filic.* v. 284, *Filic. Exot. t.* 86, *Syn. Filic.* 425.—A larger plant than *P. alcicorne*, often more membranous but the primary veins more prominent. Barren spreading fronds often more than 1 ft. diameter, the margin deeply and irregularly lobed. Fertile fronds from a broad rigid winged stipes expanding to a great breadth, dichotomously divided, but the first fork leaving a very broad truncate sinus under which the fructification forms a patch more than 6 in. diameter, in one specimen of Dallachy's 18 in. broad, the forks on each side often above 1 ft. long, deeply and dichotomously lobed but barren.—Bedd. Ferns Brit. Ind. t. 326.

Queensland. Rockingham Bay, *Dallachy;* Bowen, *Woolls;* Warwick, *Nernst;* Brisbane River, Moreton Bay, *A. Cunningham*.
N. S. Wales. New England, *C. Stuart:* Clarence River. *Beckler;* Richmond River, *Mrs. Hodgkinson*.

Also in the Malayan Archipelago.

ERRATA.

p. 139, under Kentia acuminata:

For **W. Australia**, read **N. Australia.**

p. 192, under Eriocaulon quinquangulare:

For **W. Australia**, read **N. Australia.**

p. 302, under Fimbristylis rhyticarya:

For **W. Australia**, read **N. Australia.**

p. 370, under Schoenus brevifolius, add:

S. globifer, Nees in Pl. Preiss. ii. 81, from W. Australia, *Preiss*, *n.* 1797, which I have not seen, is, from the description, probably *S. brevifolius*, R. Br., which has frequently the villous globular mass terminating the rhachis of the spikelet mentioned under *S. brevisetis*, p. 361.

p. 372, under Schoenus falcatus:

For **W. Australia**, read **N. Australia.**

p. 567, under Stipa flavescens add:

S. læviculmis, Nees in Pl. Preiss. ii. 99, founded on a specimen of uncertain origin, which I have not seen, is referred by J. D. Hooker to *S. flavescens*, with which however Nees's character does not quite agree.

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The synonyms and species incidentally mentioned are printed in italics.

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